Harding Lawson Associates

A Report Prepared for

United States Navy
Western Division
Naval Facilities Engineering
P.O. Box 727
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REMOVAL ACTION FOR PICKLING AND PLATE YARD (IR-9) VOLUME I - WORK PLAN NAVAL STATION, TREASURE ISLAND HUNTERS POINT ANNEX SAN FRANCISCO, CALIFORNIA

HLA Job No. 02176,238.02

by

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Attention: Ms. Julie Carver
Code 1811 JC

Ladies and Gentlemen:

Addendum to Draft Final
Removal Action Work Plan
Pickling and Plate Yard
Response to EPA and DHS Comments
Dated June 10 and 11, 1991
Contract No. N62474-86-D-0996
DO 045

In the June 11, 1991 letter from Mr. Chuck Flippo of the EPA to the Navy, it is stated that a letter of response to address the EPA comment on the draft final version of the work plan would be sufficient to finalize the document. Attached is an Addendum with a response to the EPA comment. Errata sheets in response to DHS comments are also included in the attached addendum to the work plan for the Pickling and Plate Yard.

Please call if you have questions or concerns regarding the attached addendum to the work plan for the Pickling and Plate Yard.

Yours very truly,

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PL:AV:ld/PL1472-R

ADDENDUM TO DRAFT FINAL REMOVAL ACTION WORK PLAN FOR THE PICKLING AND PLATE YARD HUNTERS POINT ANNEX

RESPONSE TO EPA COMMENTS DATED JUNE 11, 1991

RESPONSE AND ERRATA SHEETS IN RESPONSE TO DHS COMMENTS DATED JUNE 10, 1991

NAVY RESPONSES TO EPA COMMENTS

The following are the EPA comments of June 11, 1991 on the draft final *Removal Action for Pickling and Plate Yard, Volume I - Work Plan, Hunters Point Annex, San Francisco, California*, and the Navy's responses.

Comment: **In the Response to Regulatory Comments, Appendix A, at the top of Page 7 (currently page 9) states that three samples will be taken from each of the three bins. These specifications are not included in Section 4.6 of the text. Does the Navy intend to specify this sampling scheme in Volume II, the design specification documents? If not, how will the Navy ensure that representative samples are taken by the chosen contractor?**

Response: One grab sample for each 5 cubic yards of waste material will be collected prior to placing the waste into the bins, for a total of 3 samples per bin. One-gallon samples of decontaminated solid construction debris (i.e., concrete and bricks) will be sent to the chemical laboratory in bulk. The laboratory will crush and composite the samples prior to chemical analysis. This sampling scheme will be included in Volume II of the Removal Action for Pickling and Plate Yard - Plans and Specifications.

NAVY RESPONSES TO DHS COMMENTS

The following are the DHS June 10, 1991 comments on the draft *Removal Action for Pickling and Plate Yard, Volume I - Work Plan, Hunters Point Annex, San Francisco, California*, and the Navy's responses.

Comment: **On page 7, (currently page 9) of Appendix A, it was stated that STLC values were added to Table 3, but Table 3 does not show STLC values.**

Response: STLC values have been added to Table 3.

Comment: **On Tables 2 and 3, the same 6 collection dates are noted as June 16, 1990 and June 16, 1989. Please check the accuracy of these dates.**

Response: The date June 16, 1990 on Table 2 has been corrected to June 16, 1989.

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EXECUTIVE SUMMARY

This work plan is the first volume of the design documents for the removal action at the Pickling and Plate Yard (Site IR-9) at Hunters Point Annex in San Francisco. The work plan presents an evaluation of removal action alternatives and a conceptual description of the proposed removal action. A second volume consisting of construction plans and specifications will be prepared during the detailed design phase. Regulatory agency comments regarding the removal action and the Navy's response to the comments are presented in Appendix A. A separate report titled *Air Modeling and Risk Assessment of Airborne Contaminants During Proposed Removal Actions at the Tank Farm and Pickling and Plate Yard (ATT, 1989)* presents the methods and results of air dispersion modeling and a risk assessment conducted to evaluate potential health risks associated with the removal action. Additional references are listed at the end of the work plan.

The purpose of the removal action is to reduce the potential adverse impacts posed by this site to public health and/or the environment, and to facilitate subsequent remedial investigations. The removal action includes 1) removal of hazardous materials and hazardous surface residue on structures; 2) disposal of the hazardous material; and 3) removal of structures. No soil excavation will be performed during the removal action. The removal action is an interim remedial measure; the scope of final remedial actions at the Pickling and Plate Yard will be determined after the ongoing remedial investigation and subsequent feasibility study are complete.

Based on an evaluation of alternatives presented in the work plan, the recommended removal action includes the following:

- Removal of the zinc chromate residue by hand chipping followed by sandblasting within a temporary containment structure at the Pickling and Plate Yard. The zinc chromate residue is a hazardous waste and will be treated and disposed at a hazardous waste landfill. The sandblast material generated during the removal action is expected to be classified as a hazardous waste, requiring disposal at a hazardous waste landfill. The sandblast material will be sampled and analyzed when generated to confirm the anticipated disposal method.

- Removal of the pickling tank contents which are hazardous wastes. They will be treated and disposed at a hazardous waste landfill.

- Removal of containment vault contents, which are nonhazardous liquids. Discharge will require a permit from the City and County of San Francisco.

- Removal of the empty pickling tanks from the containment vault. The tanks will be salvaged for scrap metal value after they are decontaminated. The containment vault will be secured by the installation of a temporary roof after the tanks are removed.

- Removal and decontamination of the plate drying and storage racks, which may be salvaged or disposed as demolition wastes at a nonhazardous waste landfill. Steel structures associated with the racks will be salvaged.

The estimated cost of the work action is $395,000, with an estimated work period of 5 to 6 months.

1.0 INTRODUCTION

This work plan for the removal action at the Pickling and Plate Yard (PPY) at Hunters Point Annex (HPA), San Francisco, California (Plate 1), has been prepared for the U.S. Navy by Harding Lawson Associates (HLA). The work plan was prepared in response to requirements of the federal Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, the Superfund Amendments and Reauthorization Act (SARA) of 1986, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) of 1990. It was also prepared in response to state hazardous waste control laws presented in the California Code of Regulations (CCR).

Previous reports and activities relating to this removal action include the Implementation Assessment (*HLA, 1989a*) and a community meeting held on May 5, 1989. Public comments regarding the proposed removal action have been received and are addressed in the Responsiveness Summary (*Naval Station Treasure Island, 1989*).

1.1 Summary of Potential Environmental and Health Effects

The PPY is located on Site IR-9, one of sixteen sites at HPA being investigated as part of the Navy's Installation Restoration (IR) Program. A work plan has also been prepared for the remedial investigation and feasibility study (RI/FS) to be completed at the PPY (*HLA, 1988b,c*).

Contamination at the PPY is localized, and primarily at the ground surface. The site is in an uncovered and exposed portion of the shipyard, and is routinely subjected to winter storms, strong winds in the summer and fall, and sunlight. The site is surrounded by buildings leased by the Navy to commercial tenants.

Zinc chromate paint residue covers the paint and drying racks and sections of building walls at the shipyard. The paint contains high levels of chromium, zinc, and lead. Exposure to wind, rain, and sunlight creates the potential for the paint to flake and be carried off site, posing a potential threat to HPA employees and tenants. Given the central location of the site in relation to the shipyard, removal of the paint residue is necessary. Additionally, although the tops of the pickling tanks and containment vaults are fenced off, the pickling tanks and containment vault are open, which presents the potential for direct contact with the acidic, metal-bearing contents.

The removal action is an interim remedial measure implemented to reduce the potential threat to public health and/or the environment. The potential threat will be reduced by removing hazardous materials and the structures with hazardous surface residue(s) that may become mobile due to exposure to rain, wind, and sun. Although no soil will be excavated, control of migration and/or transport of soil via wind or surface erosion during and after removal are addressed in the work plan. Soil and groundwater characterizations and proposed solutions for subsequent remediation will be included as part of the RI/FS for the PPY and will be consistent with the overall RI/FS for HPA.

1.2 Purpose of Removal Action Work Plan

This work plan is prepared as the first task (Volume I) of the design phase for the removal action at the PPY. The work plan presents the basis of design for the removal action. The second task of the design phase will be the preparation of construction plans and specifications (Volume II). Construction documents will present the work plan in greater detail. Navy and regulatory agency comments will be incorporated in the final work plan (Volume I) before the detailed construction plans and specifications are completed.

In addition to a presentation of the removal actions to be implemented at the PPY, the work plan presents an evaluation of removal and disposal alternatives that were considered for the structures to be removed/decontaminated and selects disposal options for the structures and their contents (Section 3.0). A description of the proposed removal action, based on evaluation of these alternatives, is presented in Section 4.0. Several aspects regarding protection of workers' health and safety, such as contractors' work areas, decontamination areas, and personal protection measures are presented in Section 5.0. The preliminary construction cost estimate is presented in Section 6.0, and a schedule for construction document completion and estimated construction work period is presented in Section 7.0. Finally, the community relations activities associated with the removal action are summarized in Section 8.0.

In the next phase, detailed design, the following items will be prepared:

- demolition drawings identifying the structures to be removed and delineating contractor's work areas,
- removal action technical specifications presenting a detailed description of removal of the structures and other aspects of work, including disposal of materials, worker protection, demolition techniques, air monitoring, and, if needed, a description of the sequence of construction/demolition, and
- final cost estimate for the removal action.

Elements of the work plan which are not completely defined at this time will be reviewed and finalized during the detailed design. The elements to be addressed during the detailed design include:

- feasibility of recycling zinc chromate residue,
- preparation of waste characterization profile and determination of additional waste sampling that may be required for waste acceptance at disposal sites,

- confirmation with the City and County of San Francisco Department of Public Works that the containment vault liquids may be discharged to the sanitary sewer and identification of additional sampling requirements,
- design of the containment vault cover, and
- requirements for restoration of areas affected by the removal action.

2.0 SITE DESCRIPTION

HPA is in southeastern San Francisco at the tip of a peninsula that extends eastward into San Francisco Bay. The Navy property encompasses 965 acres, of which 522 acres are on land and the remainder are part of San Francisco Bay. The facility is bound on three sides by the bay and on the fourth side by the Hunters Point/Bay View district, a residential and commercial/industrial area.

The northern and eastern shores of HPA are developed for ship repair and equipped with drydock and berthing facilities. No shipping facilities are present along the southern shore, which consists primarily of emplaced fill.

Approximately 70 to 80 percent of the shipyard is covered by fill placed over bedrock and bay mud. Two types of fill are present. The first is derived predominantly from excavation of bedrock to create level areas for shipyard activities and varies in composition from serpentinite and associated ultramafic rocks to mixtures of serpentinite and associated Franciscan sandstone, chert, greenstone, and shale. The second type of fill is mainly sandblast waste generated by shipyard activities.

Surface drainage appears to be unconcentrated sheet-flow runoff collected by onsite storm sewer systems and discharged into San Francisco Bay. Extensive grading and construction at HPA have filled or modified preexisting drainage channels and no naturally occurring channelized drainage traverses the site.

Groundwater occurs within the unconsolidated fill and alluvial materials and probably also occurs to a limited extent within the fractured bedrock underlying the site. The depth to water in the unconsolidated materials ranges from 2 to 12 feet below ground surface; depth to water within the bedrock is unknown. Groundwater beneath the site probably flows radially from inland areas of higher elevation toward the bay, although local groundwater flow directions may be quite complex because of variations

in topography and the hydraulic properties of the fill materials. In some areas, local flow directions may vary with tidal fluctuations and localized recharge from storms.

2.1 Description of Structures to be Removed

The PPY, located in the center of HPA on the north end of Hussey Street near Spear Street (Plate 1), was used as a steel pickling yard from 1947 to 1973. Steel plates were dipped in acid tanks (pickled) and then dried on drying racks. The plates were then painted with a corrosion resistant zinc chromate based paint.

The following structures are present at the site (Plate 2) and will be addressed in the work plan: three below-ground pickling (dipping) tanks housed in an open concrete emergency containment vault; six plate drying racks and two plate storage racks; three empty acid storage tanks; a compressor building; Building 422, which was used as a toilet facility; and a large overhead crane system. Four plate storage racks have recently been partially dismantled by the Navy, and are stockpiled adjacent to the site. Chemicals used at this site in addition to zinc chromate reportedly include sulfuric acid, sodium dichromates, and phosphoric acid.

The three pickling tanks are constructed of steel and are lined with acid-resistant brick. The tanks rest on concrete pedestals in the concrete containment vault at the northwestern corner of the site. The plate storage racks, adjacent to the pickling tanks, were used to store plates while paint was applied. Painting operations for the steel plates left a paint overspray residue of zinc chromate on other structures, including some of the racks, the lower portion of the crane, and a portion of Building 422. Construction details for the pickling tanks, the containment vault, and the drying and storage racks are given in Table 1. Drawings prepared during the construction of the

pickling and plate yard will be included with Volume II construction plans and specifications.

2.2 Summary of Previous Investigations

The PPY has been the subject of three prior investigations. In 1986, the liquid contents of one pickling tank, sludge from two pickling tanks and the secondary containment vault, and a paint residue were sampled (*EMCON, 1987*). The residue sample is reported to have been collected in front of Building 420 (approximately 240 feet north and 20 feet west of the corner of Hussey Street and Building 102) from an area of dried green paint. Based on the color and consistency of the paint spot it appears to be a spill from routine maintenance on the crane and not zinc chromate residue.

The liquid, sludge, and residue samples were analyzed for total metal concentrations, including some priority pollutant metals. Analytical results reported for the samples indicated the presence of copper and lead in the sludge from the pickling tanks and the containment vault. The paint residue sample was reported to contain hazardous levels of zinc, chromium, and lead, and potentially hazardous levels (above Total Threshold Limit Concentrations [TTLCs]) of cadmium and copper, apparently originating from dust that settled in the area when the PPY was operational. The liquid from the pickling tank contained detectable levels of several metals that were not above hazardous levels (*EMCON, 1987*).

The second investigation at the PPY consisted of an evaluation by HLA of the structural integrity of the emergency containment vault beneath the pickling tanks. The report concluded that the vault could adequately contain the contents of the three pickling tanks in the event of simultaneous failure of the tanks (*HLA, 1988d*).

The third investigation at the PPY was performed by HLA in June 1989, and consisted of: 1) sampling the liquid contents of the pickling tanks and the containment vault; 2) collecting and analyzing three samples of zinc chromate residue from the drying racks; 3) installing one groundwater monitoring well to evaluate the depth to shallow groundwater; and 4) collecting and analyzing a wipe sample from the paint residue in the area reportedly sampled in 1986. Sampling methods and locations as well as analytical data are included in Appendix B. Liquid and solid residue samples were analyzed for semivolatile organic compounds (EPA Method 8270) and metals. The liquids were also tested for pH and total petroleum hydrocarbons (TPH). The wipe sample was analyzed for metals.

The analytical results are summarized in Table 2 for the liquids and in Table 3 for the zinc chromate residue. Several metals were identified in the liquids. TPH was reported in the samples from two of the pickling tanks at 0.41 and 0.16 parts per million (ppm). Miscellaneous nonpriority pollutant semivolatile organic compounds were tentatively identified in the liquids, but the presence of these compounds has not been confirmed; they are not, therefore, listed in Table 2. The estimated concentrations of the tentatively identified constituents are presented in the laboratory reports in Appendix B.

Each of the three zinc chromate residue samples contained total chromium, lead, and zinc above hazardous levels. One residue sample also contained barium and copper at hazardous (above TTLC) levels. The organic constituents reported in the zinc chromate residue are primarily phthalates, phenols, and polynuclear aromatic hydrocarbons (PNAs), such as naphthalene and phenanthrene. The presence of these organic constituents may be attributable to the semivolatile solvent matrix of the zinc

chromate paint mixture, though this has not been confirmed. Miscellaneous nonpriority pollutant semivolatile organic constituents were tentatively identified in the zinc chromate samples, but these have not been confirmed. The estimated concentrations of tentatively identified constituents are presented in the laboratory reports in Appendix B.

Analytical results of the wipe sample are included in Table 3. The sample contained low levels of several metals. The paint spot sampled using the wipe sample is physically different than the zinc chromate overspray residue and appears to be the result of a spill from routine facility maintenance operations on the crane rather than overspray from PPY operations. Additionally, the metals detected in the wipe sample taken from the paint spot are believed to be the result of zinc chromate dust that settled on the site during past PPY operations and are not representative of the zinc chromate residue. Therefore, the paint spot is not included in the proposed removal action for the PPY.

3.0 REMOVAL AND DISPOSAL ALTERNATIVES

The alternatives for removal of structures and disposal of materials during the removal action at the PPY are listed below. The following tasks were evaluated:

- removal and disposal of pickling tank and containment vault contents,
- removal of pickling tanks,
- removal or securing of containment vault, and
- removal and disposal of zinc chromate residue, and demolition and disposal of the structures.

The alternatives for these tasks are evaluated in the following sections, based on ease of implementation, regulatory agency acceptance, demonstrated performance, and cost. State and federal applicable or relevant and appropriate requirements (ARARs) defined in Title 40 of the Code of Federal Regulations in Part 268 (40 CFR 268) and California Code of Regulations Title 22 concerning disposal of wastes were also reviewed to determine appropriate disposal methods. Technically acceptable and feasible methods were evaluated for the cleanup of the contaminated structures where no ARARs were identified.

3.1 Removal and Disposal of Pickling Tank and Containment Vault Contents

3.1.1 Removal

The pickling tanks contain a combined volume of approximately 12,000 gallons of liquid and sludge that must be removed and disposed; the containment vault contains approximately 35,000 gallons of liquid and sludge. Alternatives for removal of the contents are limited and include using acid resistant pumps and related equipment to pump the contents directly into bulk transport vehicles for transport to treatment and/or disposal facilities. Liquid removal is discussed further in Section 4.2 of the work plan.

3.1.2 Liquid Disposal

The results of chemical analysis of the pickling tank and containment tank contents (Table 2) and the regulations in 40 CFR 261 and in Title 22 of the California Code of Regulations (22 CCR), Division 4, Article 11 were reviewed to evaluate whether the pickling tank and containment vault contents would be considered hazardous under federal or state regulations. The contents were potentially hazardous based on the following criteria:

Waste Material	Characteristic/Constituent
pickling tank contents	corrosive/low pH petroleum hydrocarbons metals
containment vault contents	metals trace levels of organic compounds

HLA also evaluated the option of disposing nonhazardous liquids to the HPA sanitary sewer system. A new Industrial Waste Discharge Permit will be required from the City and County of San Francisco for this option. Liquids may be disposed to the sanitary sewer system if they meet the discharge limitations applicable to all facilities given in Department of Public Works Order Numbers 104, 407, and 199-77, and site-specific limitations described in each facility's Industrial Waste Discharge Permit. The City and County of San Francisco has previously granted permission to discharge decontamination fluids generated during the RI to the sanitary sewer; therefore, this option is considered feasible if the liquid meets the discharge limitations. A permit would be required prior to discharging liquids.

3.1.2.1 Pickling Tank Contents Disposal

The contents of the pickling tanks are classified as hazardous waste under federal and state regulations. The contents of all tanks exceed the federal EP toxicity level of 5.0 ppm for chromium, exhibiting the characteristic of EP toxicity as defined in 40 CFR 261.24. The Toxicity Characteristic Leaching Procedure (TCLP) has replaced the EP toxicity test since the tank and vault contents were analyzed; however, the classification as hazardous waste is not expected to change if the TCLP were used. The contents of Tanks 2 and 3 exhibit pH levels below 2.0, and are classified as corrosive under state and federal regulations. All tanks contain selenium at levels exceeding the Soluble Threshold Limit Concentration (STLC) of 1.0 ppm, which defines a hazardous waste under California regulations [22 CCR 66699(b)]. In addition, the contents of Tank 3 exceed the STLC for copper.

Disposal of hazardous waste is regulated under 40 CFR 268 and 22 CCR 66900 *et seq.* (land disposal restrictions). Because metal concentrations in the pickling tank contents are low and because of the presence of selenium, recycling is not expected to be a viable option. Concentrations of several metals in the pickling tank contents exceed treatment standards defined in 40 CFR 268.41; therefore, the liquid can not be land disposed until it is treated to meet concentrations below the standards in 40 CFR 268.41. Because land disposal of the untreated pickling tank contents is prohibited, the following alternatives were evaluated:

- sewer system discharge of the untreated liquid,
- onsite treatment to remove the acidic property and the metals from the liquid, followed by offsite disposal of the treatment residue at an EPA-permitted treatment, storage, and disposal facility (TSD), and

- offsite treatment to remove the acidic property and the metals from the material, followed by disposal of the treatment residue at an EPA-permitted TSD.

An initial assessment of sewer system disposal concluded that the chromium content of the pickling tank contents exceeds the maximum concentration of 5.0 ppm permitted in wastewater effluent under Order Numbers 104 and 407 issued by the City and County of San Francisco. The concentrations of chromium in the pickling tanks range from 6.8 ppm to 320 ppm; therefore, sewer system discharge is eliminated as a disposal option.

Onsite or offsite treatment of the pickling tank contents would consist of neutralization, precipitation of metals, evaporation or gravity separation/pumping of liquid, and chemical fixation or stabilization of metal-bearing treatment residue. The treatment residue would then be landfilled at an EPA-permitted TSD. Onsite treatment of the pickling tank contents was rejected as the preferable option because:

- Onsite treatment facilities and operations would be disruptive to other tasks in the PPY removal action (i.e., zinc chromate sandblasting, structure demolition).

- The relatively small volume of wastes does not justify the significant costs associates with construction and mobilization of a treatment unit. Additionally, the transportation costs and disposal fees would not be significantly reduced relative to offsite treatment because treatment residue would still require transportation and TSD disposal.

Offsite treatment and disposal was selected as the most practical and cost effective alternative for the pickling tank contents. Because the TSDs contacted during a disposal survey would not accept liquids with a pH less than 2.0 or 3.0, the pickling tank contents will be neutralized onsite with soda ash or similar material before being removed for offsite treatment and disposal. Summary information on the treatment

standards applicable to hazardous constituents in the pickling tank contents and the planned disposition of the material is presented in Table 4.

3.1.2.2 Containment Vault Contents

The liquid in the containment vault is not classified as a hazardous waste under state or federal law. Metal concentrations are below federal treatment standards and California STLC limits. The pH is greater than 2.0, the level which defines a corrosive hazardous waste under state and federal regulations. In addition, the containment vault is not reported to have received any listed hazardous wastes defined in 40 CFR 261.

Because the liquid in the containment vault does not require disposal at a hazardous waste site, discharge to the sanitary sewer system appears to be the most cost-effective option. Preliminary analytical results indicate that the chromium concentration is 0.44 ppm, below the discharge limit of 5.0 ppm for the sanitary sewer. Because the pH of the liquid is 5.3, and the allowable range is 6.0 to 9.5, onsite treatment to raise the pH would be required. Because the material is not a hazardous waste, such treatment would not be subject to the hazardous waste regulations. Sewer system discharge of containment vault contents has been discussed with the San Francisco Department of Public Works, who have indicated that this option would be acceptable. Confirmation of this disposal method and determination of additional testing requirements will be completed during the detailed design phase of work.

3.2 Removal and Disposal of Pickling Tanks

After the contents of the pickling tanks and containment vault are removed, the empty pickling tanks may be removed and disposed. The acid resistant brick lining is expected to be classified as a hazardous material, based on the anticipated results of leachate testing. For the purposes of this evaluation, the brick is assumed to be

hazardous. If the bricks are later determined to be nonhazardous by chemical analysis as described in Section 4.6, they will be disposed at a Class III landfill as construction debris. The bricks are attached to the tank walls with an asphaltic adhesive, which will be removed with the bricks by mechanical or manual methods. The tanks will be cleaned with an aqueous detergent solution to remove remaining surface residue after the bricks and adhesive are removed. If underground pipes are encountered, the tanks will be disconnected and the remaining pipe will be capped in place. Final disposition of the decontaminated pickling tanks will be determined by Navy personnel.

3.3 Removal or Securing of Containment Vault

After the empty pickling tanks are removed from the containment vault, there are several options for managing the empty containment vault:

1. Remove, demolish, and dispose of the vault at a Class III landfill.

2. Leave the vault in place and cover it with a temporary lightweight (wood or aluminum) sloping roof. The roof would prevent rainwater intrusion, and inhibit unauthorized access to the empty structure. Final disposition of the vault will be addressed in the Feasibility Study (FS).

3. Leave the vault in place and backfill it, with final disposition to be addressed in the FS.

Due to shallow groundwater conditions at the site, removal actions would include excavation of soil around the vault, removal of the vault, shoring of the excavation sidewalls, and dewatering of the excavation. Shallow groundwater quality has not been evaluated at the PPY, but if the water contains levels of chemicals not acceptable for discharge into sanitary sewer, the water produced during dewatering may need to be treated or disposed as a hazardous waste. Each of these activities would significantly increase construction costs; therefore, HLA recommends leaving the vault in place.

The remaining two options (leaving the vault in place, covering or backfilling) were reviewed on the basis of cost, implementability, and impact on future site investigation work. Covering the vault will have a lower impact on future investigations than backfilling because sampling may be performed through the floor or walls of the containment vault, if necessary. Additionally, the vault may be more easily removed at a later date if it is empty. Covering the vault will not have negative impacts on the environment and will be the least costly alternative. Therefore, it is recommended to leave the vault in place and construct a cover to restrict access and prevent stormwater runoff into the vault.

3.4 Removal and Disposal of Zinc Chromate Residue and Demolition of Structures

3.4.1 Zinc Chromate Residue Removal

The zinc chromate residue is found on, beneath, and adjacent to the storage racks, on the base of the overhead crane, and on the walls of buildings adjacent to the drying rack area. The residue may be removed from the storage racks and other structures using physical methods, such as hand chipping, mechanical stripping, or sandblasting. Alternatively, the residue may be encapsulated using epoxy coatings or concrete, and the structures could then be demolished in place.

Options considered for removing the zinc chromate residue include:

1. Encapsulate the residue on the structures using an impermeable coating, then demolish the structures. The structures would be disposed as hazardous waste.

2. Remove residue using hand chipping and leave the structures in place.

3. Remove the residue using uncontained sandblasting and either leave the structures in place or dispose as nonhazardous construction debris.

4. Remove the residue using contained sandblasting. Leave the structures in place or demolish and dispose as nonhazardous construction debris.

5. Demolish and remove the structures, sandblast the demolished pieces within a containment structure, and dispose of the structures as nonhazardous construction debris.

These options were evaluated on the basis of relative cost, feasibility, potential health risks, and ease of implementation.

Encapsulation was rejected because the amount of waste to be disposed under this option would be increased rather than minimized, especially if concrete encasement is considered. Alternatively, the use of epoxy encapsulation materials would add significant amounts of organic compounds to predominantly metal contamination, complicating disposal options under 40 CFR 268.

Removal of the zinc chromate residue from the structures before disposal is preferred because the quantity of material requiring disposal as a hazardous waste will be reduced. Because hand chipping is unlikely to remove enough of the residue to render the structures nonhazardous, a mechanical removal method using a stripping medium (e.g., sandblasting) is proposed in conjunction with hand chipping.

Uncontained sandblasting was eliminated as a residue removal alternative because results of air dispersion modeling and a risk assessment indicate that potential health risks associated with uncontained sandblasting are unacceptable at distances up to 700 meters from the center of the PPY (*ATT, 1989*). Potentially unacceptable noncarcinogenic effects estimated for the removal action at the PPY may extend to greater distances from the PPY than the modeled carcinogenic risks. Therefore, the outer limit of unacceptable potential health effects is interpreted to be the location where estimated noncarcinogenic effects reach acceptable levels. Risk levels based on air dispersion models are included in the risk assessment report (*ATT, 1989*). Discussion

of public concerns regarding potential health effects of removal actions at the PPY is found in the Responsiveness Summary (*Naval Station Treasure Island, 1989*).

Containment of sandblasting operations would reduce potential health risks to nearby residents. Items to be sandblasted would be dismantled and taken to the containment structure. The containment structure will be large enough to easily perform sand blasting operations. A local exhaust system will be operated continuously until the containment structure is removed. The local exhaust equipment will be designed for a minimum of one control area air change every 15 minutes and sufficient to maintain a minimum pressure differential of minus 0.02 inches of water. Initial filters would consist of standard bag-house filters. Secondary filters on vacuums and exhaust equipment shall be high efficiency particulate air (HEPA) filters capable of trapping 99.97 percent of airborne dust greater than 0.3 microns in diameter. Based on available technical literature, it is estimated that greater than 90 percent of the emissions from the sandblasting will be contained by the filtration system and containment structure. This level of control limits the area near the PPY in which the potential health risks are unacceptable, although the area extends past the PPY boundaries. Therefore, methods to reduce the volume of zinc chromate residue that would be sandblasted were evaluated.

It is estimated that approximately 80 percent of the zinc chromate residue can be removed by hand chipping. Therefore, potential health risks associated with reduction of the zinc chromate residue volume by 80 percent and by containment of 90 percent of the sandblasting emissions were estimated. The risk assessment indicates that, with this combination of hand chipping and sandblasting, unacceptable health risks are restricted to the area around the PPY, extending a maximum of 60 meters from the center of the site. This will be the exclusion zone for the work activities at PPY. The isopleth

representing the limits of unacceptable potential noncarcinogenic effects is shown on Plate 3 (*ATT, 1991*). Based on this assessment, hand chipping of the zinc chromate residue followed by sandblasting within a temporary containment structure is proposed to reduce potential health risks associated with the removal action.

It is anticipated that the plate storage racks, the drying racks, and small buildings can be easily dismantled, making the surfaces of these structures easy to hand chip and sandblast. The massive overhead crane is not easily dismantled, and only the lower portions of the crane are covered by the zinc chromate residue. It is recommended, therefore, to hand chip the visible areas of zinc chromate residue from the crane and leave it in place. The crane has smooth, painted steel surfaces that will allow complete removal of the zinc chromate paint residue using this method.

3.4.2 Zinc Chromate Residue Disposal

Test results (Table 3) indicate that the zinc chromate residue contains metals and organic compounds. It is classified as a hazardous waste under California regulations (22 CCR 66699) because the levels of barium, total chromium, copper, lead, and zinc exceed their respective TTLCs (Table 3). Although the concentration of cadmium does not exceed the TTLC, leaching tests have not been performed on the residue to determine if it is hazardous according to the provisions of 22 CCR 66699 or 40 CFR 261.24.

The potential for recycling of the residue has been evaluated with commercial vendors. Based on the evaluation, recycling of the metals is an unlikely alternative for the residue, because of the presence of organic constituents, the small quantity of residue, and the form of the residue. Treatment and disposal will be addressed in the work plan as the worst case situation.

Treatment and/or disposal options for the zinc chromate residue are significantly affected by the land disposal restrictions defined in 22 CCR 66900 *et seq.* and in 40 CFR 268. Onsite treatment of the residue is rejected as the option of choice for the same reasons given for onsite treatment of the pickling tank contents (Section 3.1.2.1). Unless recycling options are later determined to be available, it is recommended that the residue and sandblast waste be hauled to an EPA-permitted TSD facility for chemical fixation and subsequent landfill disposal. Before the PPY wastes are hauled to the TSD, analytical tests must be performed to characterize the material and to complete the hazardous waste manifests that accompany waste shipments. The tests to be performed for waste characterization are described in Section 4.6. Summary information on the treatment standards applicable to hazardous constituents in the zinc chromate residue and the planned disposition of the material is presented in Table 4.

3.4.3 Demolition and Disposal of Structures

The structures that will be demolished and disposed from the removal action at the PPY include the concrete plate storage racks, the drying racks, and Building 422. These structures will be decontaminated in the two-step zinc chromate removal process described above. In general, the structures will be cut into smaller pieces for hand chipping and sandblasting; further demolition of the structures will not be required. The final step in decontamination of the steel structures is to wipe off zinc chromate dust that may settle on them during sandblasting. The materials used to wipe the structures will be disposed as hazardous waste. Decontaminated structures from the PPY will be disposed at a nonhazardous waste (Class III) landfill or salvaged for scrap metal. Bulk samples will be taken from concrete structures and tested for hazardous characteristics

(Section 4.6). If the material is hazardous according to federal or state regulations, it will be taken to an EPA-permitted TSD for disposal.

4.0 DESCRIPTION OF PLANNED REMOVALS

As a result of the evaluation of alternatives presented in Section 3 of the work plan, the removal actions at the Pickling and Plating Yard will consist of the following activities:

- removal of pickling tank and containment vault contents;
- removal of the empty pickling tanks;
- covering the empty containment vault;
- removal of zinc chromate residue from on, beneath, and adjacent to the storage racks and the structures adjacent to the storage racks using hand removal methods;
- demolition of the storage racks and miscellaneous structures;
- sandblasting the demolished pieces within a temporary containment building to remove zinc chromate residue; and
- disposal of wastes.

This section of the work plan describes the implementation of the removal actions.

4.1 Contractors Work Area

Before removal actions are initiated, all necessary equipment must be set up in the area surrounding the site. To prevent public access to the site during construction, Hussey and Cochrane Streets will be closed (Plate 3). Residents and employees of HPA will enter and leave buildings from Moreau and "H" Streets to avoid the controlled area. The Navy will be responsible for the notification of residents and employees who are affected by access restrictions to buildings and streets. The exclusion zone will be marked with a 6-foot high temporary chain link fence. Warning signs and portable construction barriers will be installed on closed streets.

To protect workers and to prevent migration of contaminants caused by tracking of personnel or equipment, specific work areas will be specified before operations begin and in the detailed design documents as suggested in NIOSH document *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.* The contractor will institute work areas or zones specified. Each work area will be divided into three zones: an exclusion or "hot" zone, a contamination reduction zone (CRZ), and a support zone. The preliminary designation of these zones is shown on Plates 2 and 3.

The exclusion zone will define areas where inhalation, ingestion, or dermal contact with hazardous materials is possible. The CRZ, or transition zone, will be established between the exclusion zone and support zone. To prevent off-site migration of contamination and for personnel accountability, all personnel will enter and exit the exclusion zone through the CRZ. Personnel leaving the exclusion zone will begin the sequential decontamination process in this area. The support zone will consist of a clearly marked area where the office and decontamination trailer are located. Smoking and drinking will be allowed only in designated areas; eating will only be allowed in the break area. The work area limits will extend to adjacent streets.

The exclusion zone will encompass the four areas listed below for the duration of the project:

- all areas with visible contamination,
- pickling tanks,
- sandblast area, and
- areas within the 60-meter radius of the sandblast area where the risk assessment indicates that the estimated health risks are unacceptable (Plates 2 and 3).

Zinc chromate residue has been observed on the plate storage racks south of Building 402 and north of the pickling tanks, and in the area surrounding the storage racks where paint overspray is visible. Additionally, the drying racks to the south of the pickling tanks have a small amount of residue, which appears to be zinc chromate, although this has not been confirmed. Therefore, the entire area immediately east of Hussey Street under the first bay of the overhead crane will be included in the exclusion zone, including the area presently enclosed by temporary fencing. The tentative location of the sandblast structure is shown on Plate 2. The areas shown by risk assessment to present potentially unacceptable health risks are shown on Plate 3.

Final selection of the CRZ location will depend on the contractor's operation; the tentative location is the area between the north plate storage racks and south drying racks, or the area to the east of the exclusion zone (Plate 2). The support zone will include one or both lanes of Hussey Street to accommodate areas for construction offices (trailers) and vehicle mobilization.

4.2 Pickling Tanks and Containment Vault

Removal of the pickling tanks and containment vault will be performed in the following sequence:

- removal of containment vault contents;
- removal of pickling tank contents;
- removal of the brick lining;
- in-place decontamination of the pickling tanks;
- removal of the pickling tanks;
- inspection and photographing of the vault floor and walls; and
- construction of the containment vault cover.

The following sections describe how these tasks will be accomplished.

4.2.1 Removal and Disposal of Containment Vault Contents

The containment vault contents will be neutralized to approximately pH 7.0 with soda ash or similar material and pumped into tank trucks with acid resistant pumps. Test results evaluated to date indicate that the vault contents are classified as nonhazardous under 22 CCR 66471 and 40 CFR 261. Therefore, it is anticipated that permission to discharge this material to the sewer system will be obtained from the City and County of San Francisco. In this case, the pH would be adjusted and the liquid materials discharged to the sewer at a manhole on Crisp Avenue, approximately 2,400 feet from the intersection of Spear and Sixth Avenues. The containment vault contents will be sampled, if required by the City and County San Francisco, and further characterized before the completion of the detailed design phase of work.

4.2.2 Removal and Disposal of Pickling Tank Contents

The pH of the pickling tank contents will be adjusted to >3.0 with soda ash before they are removed. A licensed transporter contracted by the Navy to remove the pickling tank contents will pump the liquid directly into the bulk storage tank of a vacuum truck. The liquid will be pumped within a closed system using equipment compatible with the acidic material. Tank rinsate will be added to the bulk tank.

Hazardous waste manifests will be completed by the Navy and the transporter, copies of which will accompany the waste to an EPA-permitted TSD facility. A waste characterization form will be completed by the Navy and delivered to the TSD facility with the waste material.

4.2.3 Removal and Disposal of Brick Lining

After the pickling tank contents are removed, the brick lining will be separated from the tank using manual or mechanical methods. It is anticipated that the bricks will be classified as hazardous waste because of metals content. The bricks will be considered a hazardous waste for purposes of completing the work plan. If sampling (as discussed in Section 4.8) shows the bricks to be nonhazardous, they will be disposed at a Class III landfill as construction debris.

After the bricks are removed, the remaining asphaltic adhesive will be chipped from the tank walls. Asphalt waste will be stored separately from zinc chromate waste, and will be disposed at a California TSD permitted for petroleum hydrocarbon wastes.

4.2.4 Decontamination of Pickling Tanks

The tanks will be double-rinsed in place with aqueous detergent solution after the liquid contents, the bricks, and asphaltic adhesive residue have been removed. Liquids produced from in-place cleaning of the pickling tanks will be added to the pickling tank contents in the transport vehicle for TSD disposal.

4.2.5 Removal of Empty Pickling Tanks

After the empty pickling tanks have been disconnected from their supports, they will be removed using the lifting lugs. A small crane will remove each tank. The tanks will then be salvaged as scrap.

4.2.6 Installation of Containment Vault Cover

After the pickling tanks and containment vault contents are removed and the vault has been photographed and inspected, the containment vault cover will be installed to minimize collection of rainwater. The type of cover will be defined during the detailed design phase of work.

4.3 Removal of Zinc Chromate Residue

Removal of the zinc chromate residue will be conducted in the following sequence:

- The racks, the crane, and the building walls will be hand chipped to remove zinc chromate residue. The structure surfaces may require wetting to minimize dust generation. Wetting will be kept to a minimum to prevent accumulation of water in the zinc chromate residue and in the work area.
- The racks and the building will be demolished (i.e., broken or dismantled into smaller pieces). The demolished pieces will be taken by forklift or small crane to the contained sandblasting area.
- The remaining zinc chromate residue will be sandblasted from the demolished structures within the contained sandblasting area.
- The crane structure will be wiped off after the removal action is complete.

The residue/sandblast waste will be stored on site until it is fully characterized for TSD disposal. The particulate filters generated during sandblasting will be emptied into the lined, covered hazardous waste bins with other sandblast waste pending testing and disposal.

4.4 Removal and Disposal of Structures

The concrete and steel drying racks and Building 422 are expected to be classified as nonhazardous materials after they are sandblasted and wiped off. It is recommended that a minimum of 1/8-inch of clean concrete material be removed from the concrete racks by sandblasting. Bulk concrete samples will be collected for testing to evaluate the presence of hazardous levels of constituents of concern. If the concrete is determined to be a hazardous waste, it will be disposed at an EPA-permitted TSD facility. If it is nonhazardous, it will be disposed at a Class III landfill. The steel racks will be evaluated for recycling; if recycling is not feasible, they may be disposed in a

nonhazardous waste (Class III) landfill with the concrete debris. The crane will remain at the site after it is hand chipped and wiped off.

4.5 Air Monitoring During Removal Actions

Air monitoring will be conducted around the site to monitor offsite transport of particulates during the removal action. A weather station will be established prior to construction to establish upwind and downwind areas of the site. One monitoring station will be established upwind of the site. Two monitoring stations will be set up near the location of the modeled isopleth of acceptable potential noncarcinogenic effects and two additional monitoring stations will be established downwind at key locations, such as residences or commercial tenants. Suggested locations for the air monitoring stations are presented on Plate 2.

Air samples will be collected using sampling equipment for airborne particulates (e.g., a high volume sampler). Samples will be collected according to the procedures described in Section 5.3 to evaluate the potential off site migration of particulates during sandblasting operations.

The air samples will be analyzed on a rush (24-hour) turnaround basis and the analytical results will be compared to the modeled air concentrations at these points. Indicator parameters were selected in the air modeling and risk assessment report and will be analyzed during the removal action. Indicator parameters include: particulate concentration, arsenic, cadmium, hexavalent chromium, nickel, lead, barium, copper, zinc, and PNAs (*ATT, 1989*). If the measured particulate or chemical concentrations are greater than those predicted in the air dispersion model and exceed concentrations of unacceptable risk, sand blasting operations will be halted. The data will be evaluated

and emissions control system checked and repaired, and if needed, additional emission reduction measures will be implemented before sand blasting operations can continue.

4.6 Waste Characterization

Existing test results (Table 2) will be used to characterize pickling tank contents and rinsate for TSD disposal.

The zinc chromate residue will necessarily be mixed with sand during sandblasting operations, changing the concentrations of metals from those observed in the residue alone. Metal concentrations in the bricks are not yet known and will require testing to evaluate treatment and/or disposal procedures. The following tests will be performed on the concrete structures, the bricks and the residue/sandblast wastes to characterize them for disposal:

Test Method	Constituent(s)
California Waste Extraction Test	--
(WET extraction)	--
EPA Test Method 1311	--
(TCLP extraction)	--
EPA Test Method 6010	antimony
(ICAP)	barium
	beryllium
	cadmium
	chromium
	cobalt
	copper
	lead
	molybdenum
	nickel
	silver
	vanadium
	zinc
EPA Test Method 7060	arsenic
EPA Test Method 7470	mercury
EPA Test Method 7740	selenium
EPA Test Method 7840	thallium

Tests for metals will be performed on the solid residue, the WET extract, and the TCLP extract. Additional tests may be required by the TSD facility before the wastes can be transported.

4.7 Construction Inspections

Construction management during the removal action will be the responsibility of the Navy; HLA personnel or others will provide oversight. Site inspections will be conducted by HLA as needed to document the following:

- adherence to the approved site-specific Job Safety Plan,
- adherence to the plans and specifications,
- prevention of contaminant migration to surrounding areas,
- proper hazardous waste management procedures, and
- regulatory compliance.

In addition, samples will be collected by HLA when required to support removal activities.

Daily field reports will be prepared by HLA for submittal to the Navy. In addition, HLA will prepare a *Removal Action Summary Report* documenting removal action activities.

5.0 WORKER HEALTH AND SAFETY

Worker health and safety is a primary consideration in all removal operations. The contractor will be required to develop procedures to protect construction workers and others from contaminants at removal action sites. Worker training, personal protective equipment, air monitoring and site safety plans are all integral parts of the construction documents to be prepared for the removal actions. Construction specifications prepared for Volume II of the design documents will provide detailed descriptions of the safety procedures discussed below.

5.1 Worker Training

Before being assigned to the site, all contractor employees will be required to complete a 40-hour Health and Safety training session and fulfill 3 days of onsite experience as required by 29 CFR 1910.120 (Hazardous Waste Operations and Emergency Response). The construction specifications developed for the project will require that the contractor furnish certification of compliance with these requirements.

Sandblasting operations will be conducted within a confined space; therefore, all personnel shall be trained in proper confined space identification and entry procedures in accordance with applicable federal and state regulations and HLA policy.

5.2 Personal Protective Equipment (PPE)

Various types of protective garments will be worn depending on the material and degree of hazard. The basic level of PPE defined for this project is Level D protective equipment. However, Level C and B protective equipment will be required in some cases, depending on the task being performed. The contractor may modify requirements described here depending on specific site conditions, equipment configuration, air monitoring results, and previous experience.

Level D will generally be required for all operations at the site including removal of tank contents. Level D equipment includes:

- chemical-resistant steel-toed work boots (or leather with disposable neoprene or nitrile rubber boot covers),
- Tyvek or Kleenguard protective coveralls (primarily to prevent soiling of work clothes),
- hard hat,
- work clothes,
- chemical resistant gloves (Neoprene or Nitrile),
- eye protection,
- hearing protection (if necessary), and
- faceshield (if necessary).

When dust is produced during removal of the zinc chromate residue, the work will require Level C protection. In general, Level C protective equipment is the same as Level D except for the addition of respiratory protection. A full-face respirator or half-face air purifying respirator with HEPA cartridge is required.

It is expected that confined space entry and sandblasting operations will require upgrading to Level B protection because a higher degree of respiratory protection is required. Level B equipment includes:

- pressure-demand (positive pressure) full-face self-contained breathing apparatus (SCBA) or airline respirator with escape SCBA,
- hooded, chemical resistant clothing, such as one or two piece splash suit or disposable chemical resistant coveralls,
- protective sandblasting clothing,
- gloves, outer (Neoprene or Nitrile) and inner (latex or PVC),
- full body harness with lifeline,

- boots, chemical resistant, steel toe and shank,
- hard hat,
- tripod or similar emergency extraction equipment,
- two-way radio, and
- ventilation equipment (if necessary).

Dust generation within the temporary structure is expected to necessitate the use of supplied air, which is standard practice for sandblasting operations.

Adequate facilities for personnel decontamination, including showers and facilities for washing shall be provided in the CRZ.

5.3 Air Monitoring for Personnel Protection

Air monitoring for personnel protection will be performed within the exclusion zone. The results of exclusion zone air monitoring for particulates will be used to determine if the level of worker PPE requires upgrading. The levels at which a PPE upgrade will be required will be defined during detailed design. Indicator parameters, as stated in Section 4.5, will be analyzed in the particulate samples. Construction specifications will describe the details of worker breathing zone air monitoring, and will require that results of air monitoring be forwarded to the Navy.

5.4 Health and Safety Plan

The removal action contractor will be required to provide a site-specific health and safety plan (HSP) that is approved by regulatory agencies and the Navy. The HSP will reference existing information including the current HSP for HLA (*HLA, 1988e*), and additional available site analytical data.

Safety procedures will include the use of a signed entry permit system, and initial and continuous air monitoring as required for all confined space work, including work in vaults or tanks. No enclosed or confined space shall be assumed to be safe until proper entry procedures have been completed.

6.0 PRELIMINARY CONSTRUCTION COST ESTIMATE

A construction cost estimate for the removal action at the PPY was developed on the basis of the removal action described in this work plan (Table 5). The removal action is estimated at $395,000, based on completion during the third quarter of 1991. The construction cost is based on discussions with removal action contractors, standard cost estimating manuals, and actual costs for material disposal. Disposal and transportation costs for different disposal sites are listed in Appendix C. Results of a contractor survey are presented in Appendix D.

Costs for activities such as tank removal and structure demolition are expected to remain constant except for expected inflationary increases. Disposal costs have risen sharply in the past, and may experience rapid changes based on market demand or regulatory requirements. Therefore, construction costs may require updating during the preparation of construction documents.

The construction cost estimate in Table 4 is based on the following assumptions, which if revised may have a significant impact on the final estimate:

- The maximum volume of pickling tank contents to be removed is 12,000 gallons. Disposal costs assume offsite treatment at an EPA-permitted facility using neutralization, precipitation, evaporation, and landfill disposal of residue.
- The maximum volume of containment vault liquids discharged to the sewer system will be 35,000 gallons.
- The pickling tanks will be removed, and the containment vault will be left in place and fitted with a temporary cover.
- The quantity of zinc chromate residue to be removed and disposed is 30 cubic yards (cu. yd.). Chemical fixation and landfill disposal are assumed.
- Decontaminated structures will be disposed as nonhazardous construction debris at a Class III landfill.

- Analytical costs include a minimum number of solid and liquid samples to characterize wastes to be disposed.
- Contingency is included to cover unknown costs for PPE and air sampling.
- Disposal costs include disposal fees, transportation, and handling.

7.0 SCHEDULE

The final design for the removal action at the PPY is in progress; construction documents will be completed by the second quarter of calendar year 1991. After completion, the plans and specifications will be submitted to regulatory agencies for approval. The approval process is expected to take a minimum of 45 days. The following is an estimated construction schedule, referenced from the notice to proceed to the contractor:

ITEM	TIME FROM START
Notice to proceed	0
Submittal/approval of all documents required prior to start-up of construction	8 weeks
Mobilization	2 weeks
Removals	8 weeks
Restoration/Cleanup/Contractor Documentation	5 weeks
TOTAL CONSTRUCTION TIME	23 Weeks

After completion of the removal action, a *Removal Action Summary Report* will be prepared by HLA and submitted to the Navy. After Navy comments are incorporated, the document will be made available for agency and public review. Preparation of the draft report will take approximately 8 weeks after completion of the work.

8.0 COMMUNITY RELATIONS

The Navy has conducted a number of community relations activities in conjunction with the PPY removal action. The removal actions have been discussed in three separate information releases. A community meeting was held with a two-month comment period. A notice was placed in the local newspaper announcing the community meeting and public comment period. A Responsiveness Summary has been prepared summarizing the community relations activities at Hunters Point Annex, and responding to written and verbal comments received by the Navy *(Naval Station Treasure Island, 1989)*.

As part of the removal action process, the Navy will continue community relations activities. These activities will include information releases describing the progress of the actions, and a second public comment period on the removal action work plan presented herein.

9.0 REFERENCES

Aqua Terra Tech (ATT), 1989. *Air Modeling and Risk Assessment of Airborne Contaminants during Proposed Removal Actions at the Tank Farm and Pickling and Plate Yard, Hunters Point Annex, San Francisco, California (Draft).* November.

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HLA, 1988b. *Work Plan Volume 2B, Sampling Plan - Group II Sites, Remedial Investigation/Feasibility Study, Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California.* November.

HLA, 1988c. *Work Plan Volume 7, Feasibility Study Plan, Remedial Investigations/Feasibility Studies, Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California.* March 1.

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HLA, 1988e. *Work Plan Volume 3, Site Safety Plan, Naval Station, Treasure Island, Hunters Point Annex, San Francisco, California.* April 14.

National Institute for Occupational Safety and Health (NIOSH), 1985. *Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities.* October 1985

Naval Station Treasure Island, 1989. *Responsiveness Summary for Hazardous Waste Removal Actions at Naval Station Treasure Island.*

TABLES

Table 1. Specifications for PPY Structures

Structure	Dimensions (feet) Length x width x depth	Tank Capacity (gallons)	Materials of Construction
Pickling Tanks (3 tanks)	44.9 x 3.0 x 13.6[1]	17,000	Steel, lined with acid-resistant brick
Emergency Containment Vault (excluding pickling tank supports)	52.0 x 30.7 x 13.7[1]	115,000	Concrete
Plate Drying Rack 1	220 x 25	not applicable	Concrete and steel
Plate Drying Rack 2	155 x 8	not applicable	Concrete and steel
Plate Drying Rack 3	135 x 30	not applicable	Concrete and steel
Plate Drying Rack 4	140 x 25	not applicable	Concrete and steel
Plate Drying Rack 5	115 x 30	not applicable	Concrete and steel
Plate Drying Rack 6	200 x 15	not applicable	Concrete and steel
Plate Storage Racks[2] (2 racks)	85 x 18 x 2[2]	not applicable	Concrete
Building 422	40 x 15 x 8	not applicable	Cinder block

1 Based on construction drawings.

2 Based on field notes or aerial photos.

Table 2. Analytical Data Summary
Pickling Tanks and Containment Vault

Constituent	Liquid Sample Location[1] PT-1 (mg/l)[2]	PT-2 (mg/l)	PT-3 (mg/l)	CV-1 Containment Vault (mg/l)	TCLP (mg/l)[3]	STLC (mg/l)[4]
Chromium, total	230	6.8	320	0.44	5.0	560
Copper	3.1	0.88	32	0.21	NV[5]	25
Lead	0.5	3.6	4.1	0.3	5.0	5
Nickel	1.2	1.8	2.3	ND[6]	NV	20
Selenium	220	2.5	2.2	ND	1.0	1.0
Zinc	4.2	3.4	23	0.58	NV	250
TPH	ND	0.41	0.16	ND	NA[7]	NA
pH (standard units)	2.1	0.9	1.5	5.3	NA	NA

Notes:

1. All samples were collected on June 16, 1989.
2. mg/l: Concentrations expressed in milligrams per liter, equivalent to parts per million.
3. TCLP: Toxic Characteristic Leaching Procedure, 40 CFR 268, Appendix I.
4. STLC: Soluble Threshold Limit Concentration, CCR, Title 22, Article 11, Section 66699.
5. NV: No value established for these compounds.
6. ND: Not detected above the laboratory reporting limit.
7. NA: Not applicable.

Table 3. Analytical Data Summary
Zinc Chromate Residue

Constituent	Sample Description: Drying Rack 1 (mg/kg)[1] (RES1)	Drying Rack 2 (mg/kg) (RES2)	Drying Rack 3 (mg/kg) (RES3)	Wipe Sample (mg/cm)[2] (WP-1)	STLC[3] (mg/l)	TTLC[4] (mg/kg)
Metals						
Barium	20,000	390	1,400	0.02	100	10,000
Cadmium	24	50	29	0.003	1.0	100
Chromium, total	50,000	53,000	38,000	0.11	560	2,500
Chromium, hexavalent	190	430	91	<0.005	5	500
Copper	21,000	2,100	460	0.02	25	2,500
Lead	4,600	4,600	3,500	0.53	5	1,000
Nickel	71	52	290	0.0028	20	2,000
Zinc	120,000	130,000	93,000	0.31	250	5,000
Organics						
Phthalates	5.4	19.2	ND(13.7)	--		NA[5]
Phenols	ND(0.37)	ND(0.24)	ND[6]	--		NA
Polynuclear Aromatics (PNAs)	ND(0.87)	ND(1.50)	ND	--		NA

Note: All samples were collected on June 16, 1989.

1 mg/kg: Concentrations expressed in milligrams per kilogram.
2 mg/cm^2: Values expressed in milligrams per square centimeter.
3 STLC: Soluble Threshold Limit Concentration, CCR, Title 22, Article 11, Section 66699.
4 TTLC: Total Threshold Limit Concentration, CCR, Title 22, Article 11, Section 66699.
5 NA: Not applicable.
6 ND: Not detected above the laboratory reporting limit. Values in parentheses are reported below the laboratory detection limit.

Table 4. Treatment and Disposal of Hazardous Wastes from the Pickling and Plate Yard

Harding Lawson Associates

EPA Waste Code	Hazardous Constituent/ Characteristic	Observed Concentration Range (ppm)	Treatment Standard from 40 CFR 268	Planned Treatment Disposition
Pickling Tank Liquid				
D002	acidic	0.9 - 2.1 standard pH units	deactivation to remove characteristic	neutralize onsite with soda ash to pH >3.0
D007	chromium	6.8 - 320	5.0 mg/l	precipitation/evaporation/ fixation/landfill burial at offsite TSD
Not applicable California listed waste only	copper	0.88 - 32	not applicable	precipitation/evaporation/fixation/ landfill burial at offsite TSD
D010	selenium	2.2 - 220	5.7 mg/l	precipitation/evaporation/fixation/ landfill burial at offsite TSD
Zinc Chromate Residue				
D005	barium	390 - 20,000	100 mg/l (TCLP extract)	fixation/landfill burial at offsite TSD
D007	chromium	38,000 - 53,000	5.0 mg/l (TCLP extract)	fixation/landfill burial at offsite TSD
Not applicable California listed waste only	copper	460 - 21,000	not applicable	fixation/landfill burial at offsite TSD

Table 4. Treatment and Disposal of Hazardous Wastes from the Pickling and Plate Yard

Harding Lawson Associates

EPA Waste Code	Hazardous Constituent/ Characteristic	Observed Concentration Range (ppm)	Treatment Standard from 40 CFR 268	Planned Treatment Disposition
D008	lead	3,500 - 4,600	5.0 mg/l (TCLP or EP Toxicity extract)	fixation/landfill burial at offsite TSD
No Applicable California listed waste only	zinc	93,000 - 120,000	not applicable	fixation/landfill burial at offsite TSD

Notes: TCLP - toxicity characteristic leaching procedure - 40 CFR 268 - Appendix I

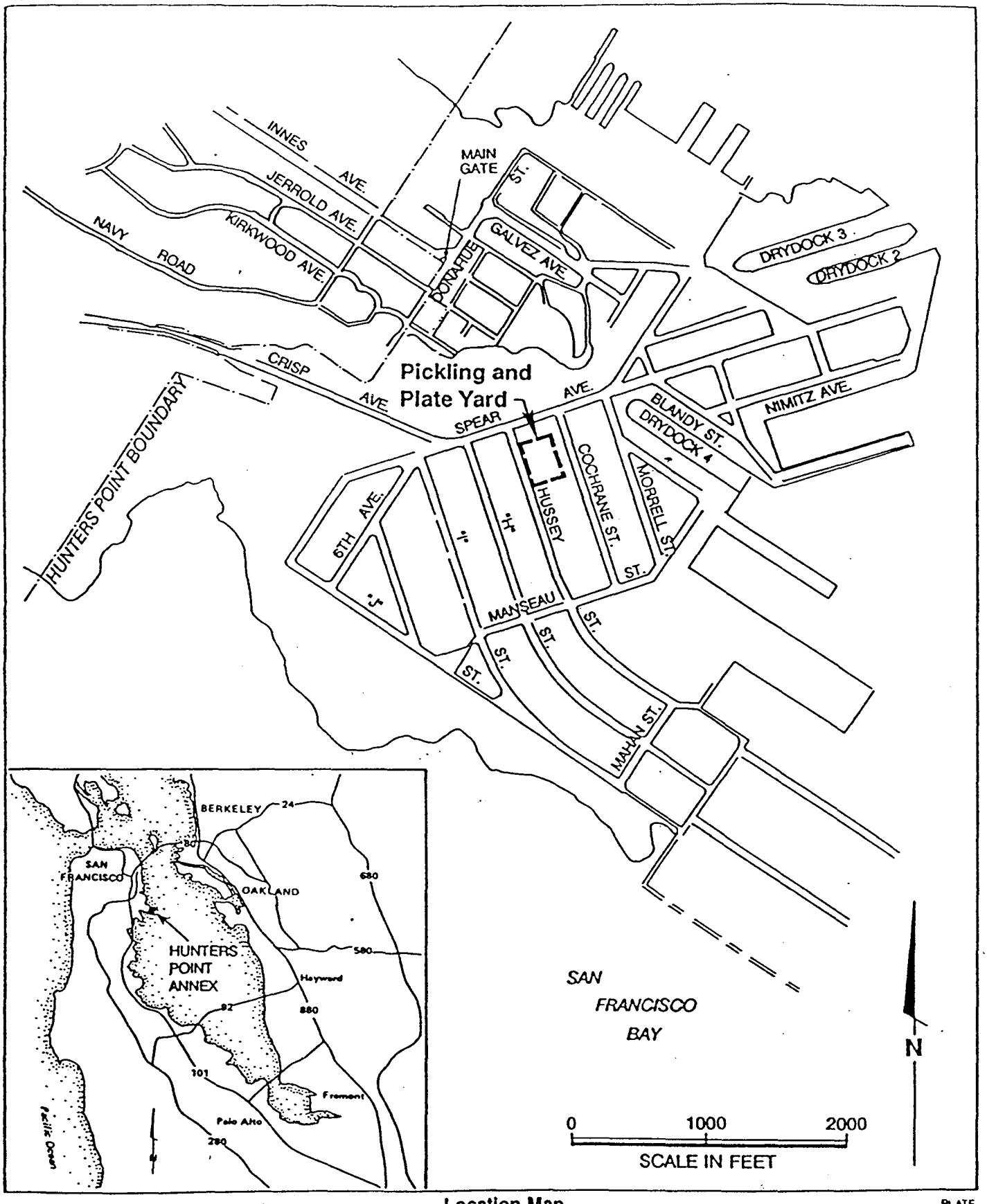
Table 5. Preliminary Construction Cost Estimate: Pickling and Plate Yard

Harding Lawson Associates

ITEM	DESCRIPTION	QTY	UNITS	MATERIAL UNIT	EXTENDED COST	LABOR UNIT	EXTENDED COST	TOTAL UNIT	TOTAL COST
1	MOBILIZATION	1	EA	$5,000.00	$5,000.00	$0.00	$0.00	$5,000.00	$5,000.00
2	DEBRIS REMOVAL	1	LS	$5,000.00	$5,000.00	$0.00	$0.00	$5,000.00	$5,000.00
3	CONTAINMENT VAULT LIQUID REMOVAL & DISPOSAL	35000	GAL	$0.50	$17,500.00	$0.00	$0.00	$0.50	$17,500.00
4	PICKLING TANK LIQUID REMOVAL & DISPOSAL	12000	GAL	$3.00	$36,000.00	$1.00	$12,000.00	$4.00	$48,000.00
5	PICKLING TANKS REMOVAL	3	Lump Sum (LS)	$2,000.00	$6,000.00	$3,000.00	$9,000.00	$5,000.00	$15,000.00
6	COVER CONTAINMENT TANK	1	LS	$5,000.00	$5,000.00	$1,000.00	$1,000.00	$6,000.00	$6,000.00
7	HAND REMOVAL ZINC CHROMATE	25	CU. YD.	$250.00	$6,250.00	$250.00	$6,250.00	$500.00	$12,500.00
8	DRYING RACK DEMOLITION	1	LS	$10,000.00	$10,000.00	$15,000.00	$15,000.00	$25,000.00	$25,000.00
9	BUILDING DEMOLITION	1	EA	$10,000.00	$10,000.00	$5,000.00	$5,000.00	$15,000.00	$15,000.00
10	SANDBLASTING	500	SQ. FT.	$10.00	$5,000.00	$5.00	$2,500.00	$15.00	$7,500.00
11	DISPOSAL: ZINC CHROMATE	30	CU. YD.	$286.00	$8,580.00	$100.00	$3,000.00	$386.00	$11,580.00
12	DISPOSAL: SANDBLASTING / ZINC CHROMATE WASTE BRICKS	90	CU. YD.	$250.00	$22,500.00	$100.00	$9,000.00	$350.00	$31,500.00
13	DISPOSAL: DEMOLITION WASTE	140	CU. YD.	$50.00	$7,000.00	$25.00	$3,500.00	$75.00	$10,500.00
14	SITE CLEAN-UP	1	LS	$5,000.00	$5,000.00	$0.00	$0.00	$5,000.00	$5,000.00
15	ANALYTICAL	1	LS	$10,000.00	$10,000.00	$0.00	$0.00	$10,000.00	$10,000.00
16	SANDBLAST CONTAINMENT	1	LS	$10,000.00	$10,000.00	$0.00	$0.00	$10,000.00	$10,000.00
	SUBTOTAL W/O MARKUP & CONTINGENCY								$235,000.00
	CONTRACTOR OH&P	20	PERCENT						$47,000.00
	*** SUBTOTAL ***								$282,000.00
	CONTINGENCY	40	PERCENT						$112,800.00
	TOTAL CONSTRUCTION COST								$395,000.00

ILLUSTRATIONS

14596

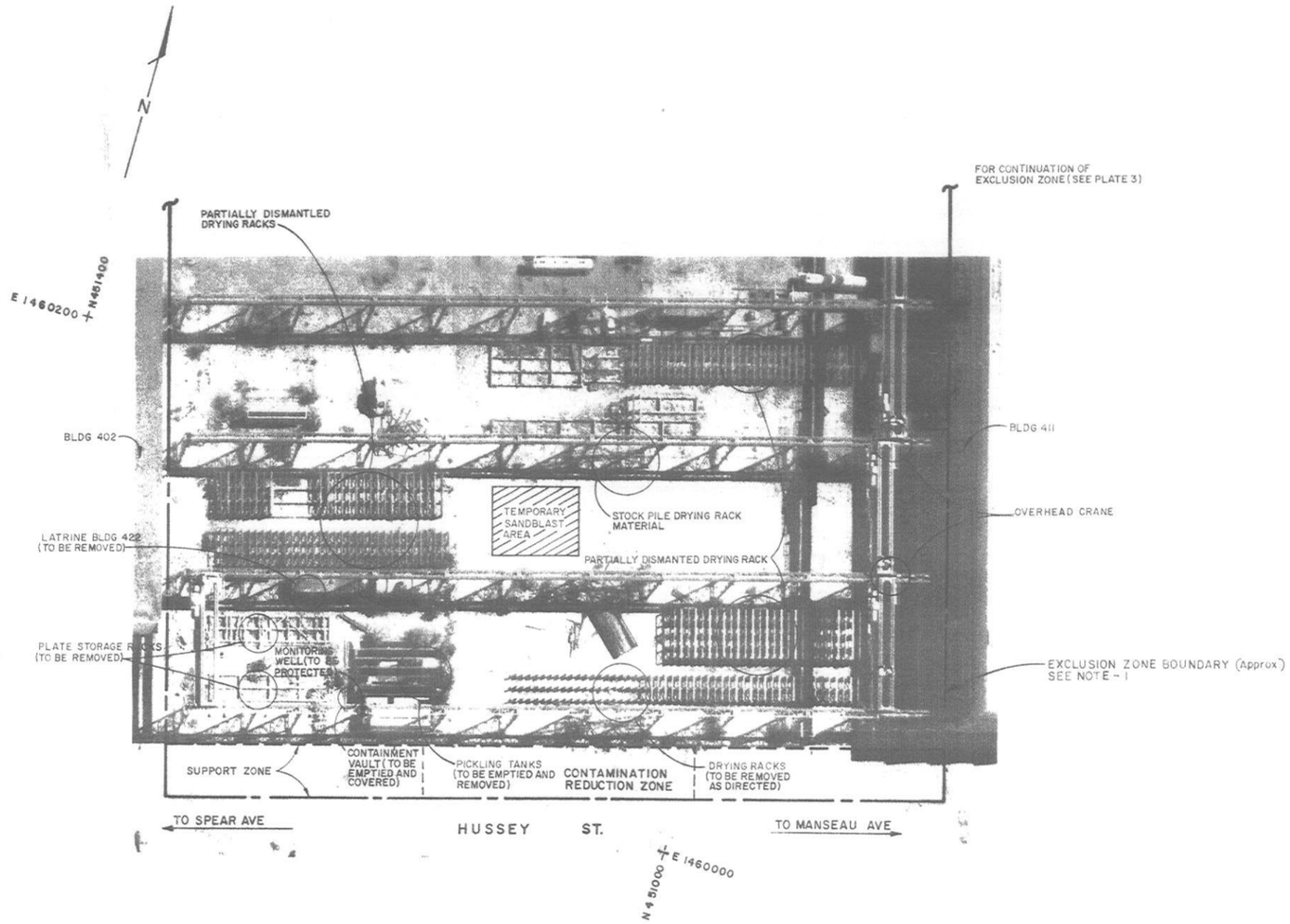


Harding Lawson Associates
Engineers and Geoscientists

Location Map
Pickling and Plate Yard
Hunters Point Annex
San Francisco, California

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	2176,245.02		9/89		



GENERAL DEMOLITION PLAN

0 40' 80'
SCALE IN FEET

NOTES

1) Exclusion Zone Boundary may be modified depending on contractor's operation, and air monitoring results.

PLATE 2

NO.	DATE	REVISIONS	BY
1	10-18-90	WORK AREA BOUNDARY CHANGES	JEB

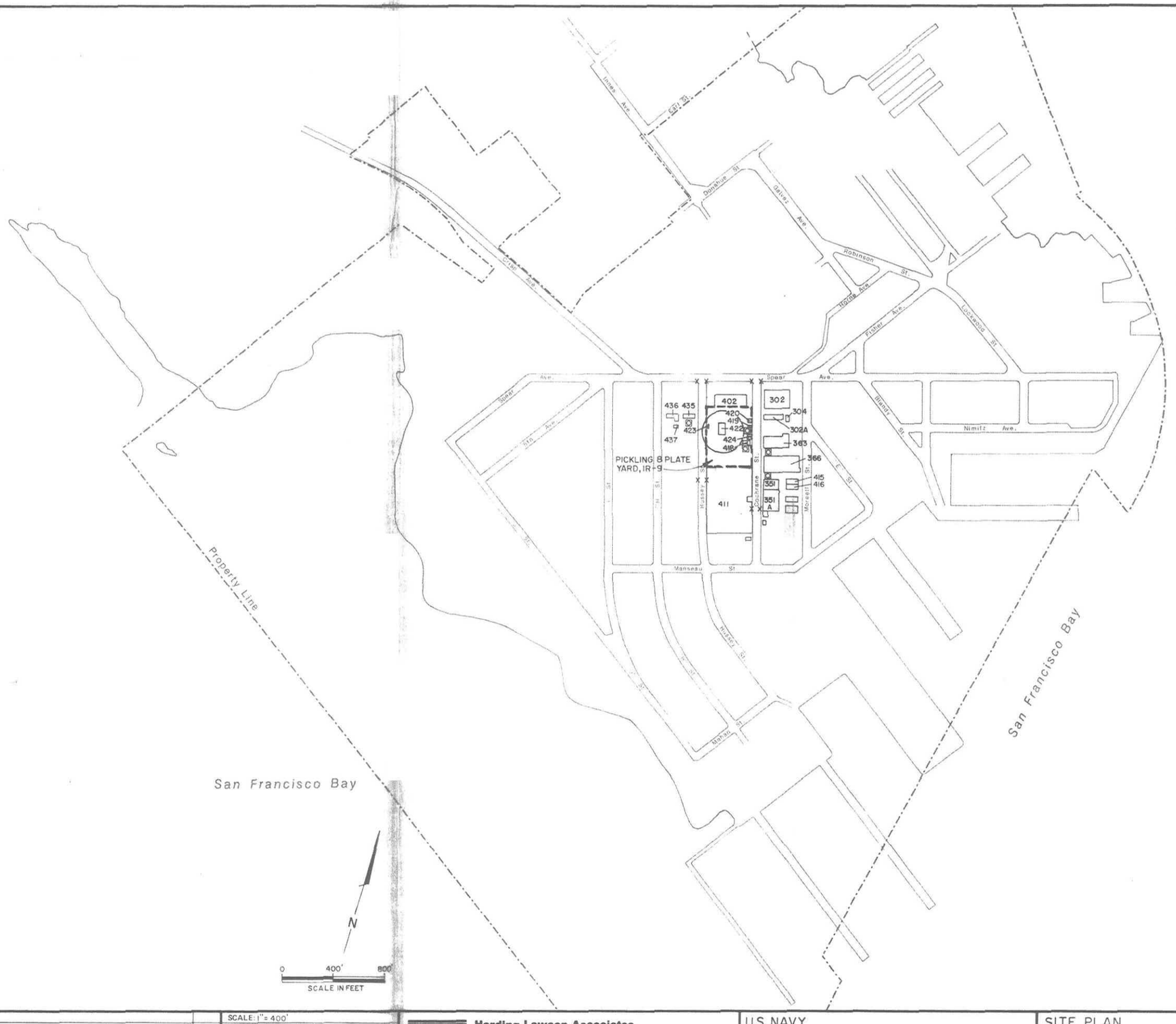
SCALE: 1"= 40'
DESIGNED BY: D. WING
DRAWN BY: a.h.b
CHECKED BY:
DATE:
APPROVED BY:
DATE:

HLA
Harding Lawson Associates
Engineers and Geoscientists
P.O. Box 578
Novato, California
(415)892-0821

U.S. NAVY
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

REMOVAL ACTION FOR THE PICKLING AND PLATE YARD
VOLUME I - WORK PLAN

JOB NO.: 02176,238.02
DRAWING NO.:
REV.: 1



EXPLANATION

366 — SELECTED EXISTING BUILDINGS

BOUNDARY OF HUNTERS POINT ANNEX

ISOPLETH - LIMITS OF UNACCEPTABLE POTENTIAL NONCARCINOGEN EFFECTS (90% CONTAINMENT)

EXCLUSION ZONE BOUNDARY (APPROX.)

XX — TRAFFIC CONTROL BARRIER & CONSTRUCTION WARNING SIGNS.

AIR MONITORING STATION

PLATE 3

NO.	DATE	REVISIONS	BY

SCALE: 1" = 400'
DESIGNED BY: D. WING
DRAWN BY: a.h.b.
CHECKED BY:
DATE:
APPROVED BY:
DATE:

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U.S. NAVY
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA

SITE PLAN
AIR MODELLING ISOPLETHS
REMOVAL ACTION-PICKLING & PLATE YARD
VOLUME I - WORK PLAN

JOB NO.: 02176,238.02
DRAWING NO.:
REV.:

Appendix A

RESPONSE TO REGULATORY AGENCY COMMENTS

APPENDIX A

This appendix contains the following documents regarding the draft *Removal Action for Pickling and Plate Yard, Volume I - Work Plan, Hunters Point Annex, San Francisco, California*, dated April 16, 1990.

- California Department of Health Services (DHS) comments dated March 23, 1990 and Navy responses to DHS comments.
- United States Environmental Protection Agency (EPA) comments dated March 26, 1990 and Navy responses to EPA comments.

NAVY RESPONSES TO DHS COMMENTS

The following are the DHS March 23, 1990 comments on the draft *Removal Action for Pickling and Plate Yard, Volume I - Work Plan, Hunters Point Annex, San Francisco, California*, and the Navy's responses.

Comment: **Page 1, Section ES, Paragraph 3, Bullet 1. Is the zinc chromate residue subject to land disposal restrictions?**

Response: The zinc chromate residue is subject to land disposal restrictions. Discussion of this was added to Section 3.4.2 and in Table 4.

Comment: **Page 3, Section 1.0, Paragraph 2, Line 6. "California Administrative Code" should be replaced with California Code of Regulations (CCR).**

Response: This correction was implemented.

Comment: **Page 4, Section 1.1, Paragraph 3, Line 6. As described in the report, no soil will be removed during this removal action. If soil is removed, identify characterization and disposal procedures.**

Response: The text on Page 4 was changed to state that no soil will be excavated during the removal action.

Comment: **Page 10, Section 2.2, Paragraph 2, Line 1. Each zinc chromate sample contained chromium, lead and zinc at hazardous levels. Identify that hazardous levels (above TTLC) of copper and barium were also present.**

Response: This information was added to the discussion in Section 2.2.

Comment: **Page 11, Section 2.2, Paragraph 1. Where is the "paint spot" located. Since the chemical composition of the paint spot is the same as the residue, the material has been characterized as hazardous and must be removed.**

Response: The paint spot location was added to Section 2.2, first paragraph. The paint spot sampled is physically different than the zinc chromate overspray residue and has been determined to be the result of a spill from routine facility maintenance operations on the crane rather than overspray from PPY operations. Additionally, the metals detected in the wipe sample taken from the paint spot are believed to be the result of zinc chromate dust that settled on the site during past PPY operations and are not representative of the zinc chromate residue. Therefore, the paint spot is not included in the proposed removal action for the PPY. This is clarified in the last paragraph of Section 2.2.

Comment: **Page 12, Section 3.0, Paragraph 2. Identify potential state and federal ARARs in the table format.**

Response: The ARARs from 40 CFR 268 applicable to the site are presented in Table 4. In this situation, ARARs are treatment standards.

Comment: **Page 13, Section 3.1.2, Paragraph 2. Precisely identify where the nonhazardous liquids will be discharge into the sanitary sewer system.**

Response: The point of discharge to the sanitary sewer system has been identified in Section 4.2.1.

Comment: **Page 14, Section 3.1.2.1. Was recycling of the pickling tank contents considered?**

Response: Recycling is considered infeasible because metal concentrations are low and because of the presence of selenium. This has been clarified in Section 3.1.2.1.

Comment: **Page 15, Section 3.2, Paragraph 1, Lines 5 and 6. Clarify and rewrite.**

Line 8. Does this mean the tanks will be steam cleaned (high temperature and high pressure)?

Were the tanks filled via an underground or above ground piping system? If under ground piping is found, how will you deal with it?

Response: Section 3.2 has been rewritten for clarification. The tanks will not be steam cleaned. If underground piping is encountered, it will be disconnected from the tanks and capped in place. This information was added to Section 3.2.

Comment: **Page 16, Section 3.3. Prior to capping, inspect and photograph the vault and document the results i.e. cracks, piping and relative locations.**

Response: Inspection and photographing of the vault has been added to the discussions in Sections 4.2 and 4.2.6.

Comment: **Page 20, Section 3.4.2, Paragraph 1. How will the sandblast material be characterized?**

Response: Characterization of the residue/sandblast material has been addressed in Section 4.6. Test methods and target analytes were described.

Comment: **Page 21, Section 3.4.3, Paragraph 1. Since Building 422 is constructed of cinder-block, will sandblasting be appropriate and effective?**

Response: Sandblasting is considered to be appropriate and effective for Building 422.

Comment: **Page 22, Section 3.4.3, Paragraph 1, Line 3. Specify that non-hazardous demolition debris can be disposed of at a Class III landfill.**

Response: Class III landfill disposal of nonhazardous demolition debris has been added to the texts of Sections 3.4.3 and 4.4.

Comment: **Page 24, Section 41., Paragraph 3. How will the exclusion zone perimeter be identified (marked)?**

Response: The exclusion zone perimeter will be marked with a 6-foot high temporary chain link fence. This information was added to Section 4.1.

Comment: **Page 26, Section 4.2.1, Paragraph 1, Line 5. How will the pH of the nonhazardous containment vault liquids be adjusted prior to disposal into the sanitary sewer?**

Precisely identify where the nonhazardous liquids will be discharge into the sanitary sewer system.

Will the vault sludge be characterized prior to disposal?

Response: The text of Section 4.2.1 has been changed to state that soda ash or similar material will be used to adjust the pH of the containment vault contents. The location of the point of discharge to the sewer system was added to the first paragraph of Section 4.2.1. Sludge was not reported to be present in the containment vault during the sampling of June 1989. If sludge is encountered during the removal action, it will be tested with other wastes from the PPY.

Comment: **Page 26, Section 4.2.2, Paragraph 1, Line 5. Identify that the liquid from the pickling tanks will be sent to a permitted disposal facility.**

Response: This information has been added to Section 4.2.2.

Comment: **Page 27, Section 4.2.4, Paragraph 1. How will the brick lining be tested to determine if it is hazardous?**

Response: Characterization of the brick lining has been addressed in Section 4.6.

Comment: **Page 27, Section 4.2.5, Paragraph 1. Prior to capping, inspect and photograph the vault and document the results i.e. cracks, piping and relative locations.**

Response: Inspection and photographing of the vault has been added to the discussions in Sections 4.2 and 4.2.6.

Comment: **Page 27, Section 4.3, Paragraph 1. Water volumes should be controlled during wetting.**

Response: This has been stated in Section 4.3.

Comment: **Page 28, Section 4.3, Paragraph 3, Line 8. A WET should be run if contaminants exceed 10x the STLC.**

Response: A WET procedure has been planned for the zinc chromate residue/sandblast material, as described in Section 4.6.

Comment: **Page 29, Section 4.4.1, Paragraph 1. Wipe tests should be performed on "decontaminated" (sandblasted) materials.**

Response: Wipe tests are not planned for the sandblasted materials. Steel structures will be stripped of visible residue and wiped off to remove dust from sandblasting operations. Bulk samples will be taken from concrete structures because they are porous and may have adsorbed hazardous constituents. If the concrete is determined to be hazardous according to federal or state regulations, it will be disposed as inorganic solid debris (ISD) at an offsite EPA-permitted landfill. This information has been added to Sections 3.4.3 and 4.4.

Comment: **Page 30, Section 4.6, Paragraph 2. What is the anticipated volume of sandblast material? Three (3) samples may not be enough for a representative analysis.**

Response: The anticipated volume of sandblast material is 50 cubic yards. Three samples will be taken from each 20 cubic yard bin of material for analysis.

Comment: **Page 35, Section 5.4, Paragraph 1. The Health and Safety Plan must be approved by the appropriate regulatory agencies prior to any field work.**

Response: This has been clarified in Section 5.4.

Comment: **Page 36, Section 6.0, Paragraph 3, Bullet 1. Off-site treatment must be done by a permitted facility.**

Response: This information has been added to the first bullet item in Section 6.0.

Comment: **Table 1. Add Building 422 specifications.**

Response: Building 422 specifications have been added to Table 1.

Comment: **Tables 2 and 3. Add sampling dates.**

Response: Sampling dates have been added to Tables 2 and 3.

Comment: **Table 3. Add STLC numbers.**

Response: STLC numbers have been added to Table 3.

Comment: **Appendix A, Section 2.1, Paragraph 2. The sample of containment vault liquid may not be representative of the vault liquid. Stratification of the liquid has undoubtedly occurred and the Department is unsure of how the sample was obtained. Further discussion of the vault sampling procedures should be presented.**

Response: Stratification of liquid in the containment vault is not expected to occur. Unlike organic mixtures, inorganic substances with low metal concentrations do not form layers that represent various specific gravities. Additionally, the low levels of metals observed in the vault contents are not expected to result in observable concentration gradients.

NAVY RESPONSE TO EPA COMMENTS

The following are EPA's March 26, 1990 comments on the draft *Removal Action for Pickling and Plate Yard, Hunters Point Annex, San Francisco, California*, and the Navy's responses.

Comment 1: **Page 1, second paragraph. The last sentence of this paragraph states that "No soil removal is anticipated for this removal action." On Page 4, in the last paragraph, the third sentence starts "Although significant quantities of soil will not be removed,..." Please clarify whether or not soil will be removed. The waste characterization applied to the disposal facility should include soil analytical data if soil is included in the waste stream. The presence of soil in the waste stream could also affect treatment, if required.**

Response: The text on Page 4 was changed to state that no soil will be excavated during the removal action.

Comment 2: **Page 10, last paragraph. According to Table 3, the zinc chromate residue contains cadmium in addition to chromium, lead, and zinc. The total cadmium levels presented in Table 3 are more than 16 times the EP Tox level, indicating the possibility that leachate could exceed EP Tox levels for cadmium. In order to determine the applicability of land disposal requirements, as well as to ensure proper notification of any off-site storage, treatment or disposal facility which may handle this waste, the residue should be subjected to the EP Tox test for cadmium, chromium, and lead.**

[Please note that EPA is about to publish a final rule replacing the EP Tox test with the TCLP, which is currently required only to determine compliance with Land Disposal Restrictions standards. The TCLP will replace EP Tox for large quantity generators (> 1000 kg per month) at the end of August, 1990, and for small quantity generators (between 100 and 1000 kg per month) at the end of March, 1991. Depending on the timing of the removal activities, this regulatory change could affect the PPY action. Consequently, references in our comments to EP Tox should be understood to apply as well to the new TCLP regulation once that takes affect for any activities at HPA. Please also note that the new regulation adds several new organic

constituents to the list that are included in the TCLP analysis.]

Response: In revising the work plan for the PPY to address agency comments, replacement of the EP toxicity test with the TCLP is assumed. Cadmium, chromium, and lead are included in the target analytes for zinc chromate residue (Section 4.6).

Comment 3: **Page 12, section 3.0, second paragraph. It would be helpful to summarize the ARARs considered and the determination as to their applicability to this situation. It would also be helpful to identify the agencies contacted concerning potential ARARs. This information could be presented in table or chart form.**

Response: The ARARs from 40 CFR 268 applicable to the site are presented on Table 4. In this situation, ARARs are treatment standards.

Comment 4: **Page 14, section 3.1.2.1, last paragraph. EPA expects land disposal restrictions on characteristic wastes (part of the so-called "third third" rules) to take effect for most EP Tox wastes by early May. The treatment standard for D007 wastewater (EP Tox for chromium) presented in the proposed regulations is 0.32 mg/kg (total chromium). (See 54 FR 48372, November 22, 1989.) The effects of these regulations on disposal of the pickling tank contents need to be considered in the final workplan. Although the treatment standard cited here is subject to change in the final regulations (due out by May 8, 1990), it is useful to treat the proposed regulations as "to be considered" requirements at this time and address this in the final workplan. In addition, the cost of complying with the land ban treatment requirements should be assessed, as this could significantly affect implementation of the removal action.**

Response: Land disposal restrictions, including the TCLP and associated treatment standards have been addressed in the revised work plan (Sections 3.1.2.2 and 3.4.2, and Table 4). Costs for compliance with land disposal restrictions are included in the estimates on Table 5.

Comment 5: **Page 15, section 3.2. The last half of this paragraph is confusing and needs to be rewritten. We assume the phrase "If found to be *nonhazardous* ..." was meant to read "If found to be *hazardous* ..." The next sentence is also confusing. Finally, the workplan needs to address collection, sampling, analysis, and disposal of wastewater from the steamcleaning operation, if used.**

Response: The text has been revised to clarify the information. Steam cleaning will not be used in the removal action. Rinsate from aqueous detergent washing will be added to the pickling tank contents for disposal; the volume of rinsate will be kept to a minimum.

Comment 6: **Page 16, section 3.3. In the second paragraph, the second sentence needs to be rewritten ("disposal... may need to be disposed..."). Also, the vault should be inspected, after removal of the contents, for any visible cracks, holes, etc.**

Response: The text of Section 3.3 is revised for clarity. Inspection and photographing the vault has been added to the discussions in Section 4.2 and 4.2.6.

Comment 7: **Page 20, section 3.4.2, first paragraph. The statement in the fourth sentence, that "although this testing [EP Tox] is not required at this time because the waste is classified as hazardous by state regulations," is incorrect and should be deleted. Since California is not authorized under RCRA Section 3006, the fact that a material is hazardous under State regulation has no bearing on its status as a RCRA-regulated waste. It could be argued that the tests undertaken pursuant to the Title 22 requirements provide the generator with sufficient data to make a determination under 40 CFR 262.11(c)(2) that the material is a RCRA-regulated characteristic waste, thus precluding the need for EP Tox testing. If this is what is meant, it should be so stated. (However, as noted in comment #2, there may be other reasons, such as the Land Ban, to perform confirmatory EP Tox (or TCLP) analysis.**

Also, as noted in comment #2, cadmium levels are high enough EP Tox testing is needed to see if this is also a D006 waste.

Finally, the last paragraph mentions that only recycling of the zinc chromate residue will be further evaluated. Additional treatment alternatives, such as on-or off-site chemical fixation, also need to the considered and evaluated.

Response: Refer to the response to Comment #2. Cadmium will be included in waste characterization testing. On and offsite chemical fixation has been addressed in Section 3.4.2 for the zinc chromate residue.

Comment 8: **Page 21, top paragraph. See comment #4 above. Our concern with the potential impacts of the "third third" land disposal regulations, and the need to consider the proposed regulations now, apply to the zinc chromate residue as well as the pickling tank contents.**

Response: Refer to the response to Comment #4.

Comment 9: **Page 24, second and third paragraphs. Plate 2 appears to contradict the second paragraph, in that the "transition zone" and the support zone appear to be within the exclusion zone. It also appears from Plate 3 that the decon area is well within the boundaries of the area of unacceptable health risks described in bullet #4. Please clarify this.**

Response: Plate 2 has been revised to show the correct locations of the support zone, the exclusion zone and the decontamination area.

Comment 10: **Page 26, second paragraph. Again, this description of the CRZ is contradicted by the drawing on Plate 2. Although the drawings are subject to change, it is confusing to have this apparent contradiction. Plate 2 should be redrawn to show the CRZ and support zone outside the exclusion zone.**

Response: These corrections have been made on Plate 2.

Comment 11: **Page 26, section 4.2.2, first paragraph. At a minimum, the pickling tank contents will need to be neutralized and solidified, as noted earlier in the Workplan. Where will this treatment take place? Regarding the last sentence in this paragraph, we would expect additional sampling to be needed following treatment and prior to disposal. (If this is done at an off-site TSD, sampling and analysis would be done in accordance with the facility's waste analysis plan.) Also, as noted in comment #4 above, analysis may be required pursuant to the expected land disposal regulations.**

Response: The management of the pickling tank contents has been addressed in greater detail in Sections 3.1.2.2 and 4.6. Land disposal restrictions have been addressed in Section 3.1.2.2 and in Table 4.

Comment 12: **Page 26, last paragraph. While it may be acceptable to assume the material is a RCRA-regulated hazardous waste if the total concentration of any metal exceeds the TTLC (see comment #7), the reverse is not necessarily true. That is, if the total level of any metal is below the TTLC, but above the EP Tox level (or, for a solid, above the EP Tox level by a factor of 16 or more, the EP Tox test must be conducted to determine whether or not it is a hazardous waste. The California WET should be run in addition to EP Tox. (Please see comment #2 concerning the TCLP test.)**

Response: Section 4.6 has been revised to include WET and TCLP extractions for waste characterization.

Comment 13: **Page 29, section 4.4.1, first paragraph. The Workplan calls for the decontamination of the concrete drying racks by sandblasting a minimum of 1/8-inch of clean concrete material from the racks. The Workplan must identify how the concrete will be sampled and analyzed to determine when it is "clean". How is "clean" to be defined (i.e. in terms of contaminant levels)?**

Response: Bulk samples will be taken from concrete structures because they are porous and may have absorbed hazardous constituents. If the concrete is determined to be hazardous according to federal or state regulations, it will be disposed as inorganic solid debris (ISD) at an offsite EPA-permitted landfill. This information has been added to Sections 3.4.3 and 4.4.

Comment 14: **Table 1, Analytical Data Summary - Pickling Tanks and Containment Vaults. The units for TPH should be μg/l.**

Response: Table 2 has been changed to correct the units for TPH.

Comment 15: **Table 3, Analytical Data Summary - Zinc Chromate Residue. the units for the wipe sample are given in mg/l. The units for a wipe sample are typically presented as a concentration per unit area (example: mg/cm^2). Comparison to a TTLC may not be appropriate for this type of sample.**

Response: The units for the wipe sample results have been corrected to mg/cm^2.

Comment 16: **Appendix A, Overall. Several important analytical parameters appear to be missing from the Workplan. Although the report from the laboratory indicates that sample blanks, surrogates and matrix spikes were run for volatiles, only the data on the surrogates were included. No QC date was included for the Total Petroleum Hydrocarbons analysis, and only the spike analyses were included for the metals analyses. We recommend that a complete data validation to assess the adequacy of the data be performed. Analytical data for the blanks, surrogates, and spikes should be included with all data packages.**

Response: QA/QC data will be included in the data packages generated for future testing of wastes from the PPY.

Comment 17: **Appendix A, page 3, section 2.1, first paragraph. In the last sentence, the Plate should be labeled "B-2" rather than "2", to avoid confusion with Plate 2 in the main text.**

Response: Appendix A is a separate report, "Plate 2" refers to Plate 2 in this report. Appendix A also has a "Plate B-2", which is one of the boring logs.

Comment 18: **Appendix A, Table 6. In note 2, we presume the two EPA methods cited, 60 and 7106, should be 6010 and 7196, respectively.**

Response: These corrections have been implemented.

Appendix B

SAMPLING AT THE PICKLING AND PLATE YARD

A Report Prepared for

Western Division
Naval Facilities Engineering Command
900 Commodore Drive, Bldg. 101
San Bruno, California 94066-0720

DRAFT

SAMPLING AT THE PICKLING AND PLATE YARD HUNTERS POINT ANNEX SAN FRANCISCO, CALIFORNIA

HLA Job No. 02176,245.02

by

Kit Richard
Staff Geologist

Mary E. Lucas
Project Manager

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Novato, California 94948
415/892-0821

December 11, 1989

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LIST OF TABLES

LIST OF ILLUSTRATIONS

1.0 INTRODUCTION

This report describes the methods for and presents the results of sampling conducted by Harding Lawson Associates (HLA) at the Pickling and Plate Yard, Hunters Point Annex (HPA), San Francisco, California (Plate 1). The sampling was conducted to provide data for the planned removal action at the Pickling and Plate Yard.

1.1 Site Description

The Pickling and Plate Yard, located on the north end of Hussey Street near Spear Street (Plate 1), was a steel pickling yard from 1947 to 1973. Structures at the site consist of three below ground dipping tanks within a containment vault, plate drying and storage racks, three empty acid storage tanks, a compressor building, Building 422, which was used as a toilet facility, and a large overhead crane system.

The dipping tanks and containment vault contain fluids. Zinc chromate residue covers many of the plate storage and drying racks, Building 422, and lower portions of the overhead crane system. The zinc chromate and the liquids are the wastes that will be removed during the planned removal action at this site.

1.2 Scope of Investigation

Sampling activities at the Pickling and Plate Yard consisted of:

1) sampling of the zinc chromate residue on the drying racks to provide data for the evaluation of disposal options for the material. These data will also be used in the planned air modeling and risk assessment to evaluate potential health risks associated with sandblasting the structures at the Pickling and Plate Yard;

2) installation of a temporary ground-water monitoring well to evaluate the depth to shallow ground water at this site;

3) measurement of fluid level and pH in the temporary monitoring well and the fluid levels of the pickling tanks and containment vault to evaluate

whether the tanks and vault may be in communication with the ground water;

4) sampling of the fluid within the pickling tanks and containment vault to evaluate disposal options for the water; and

5) collection of a wipe sample from a small paint spot previously sampled by others (*EMCON, 1987*) to evaluate whether this paint spot should be removed during the planned removal action at the site.

This report presents the methods and results of this sampling. The results will be evaluated in the work plan prepared for the removal action at this site. The sampling activities were conducted on June 15 and 16 and September 21, 1989.

2.0 FIELD INVESTIGATION AND LABORATORY ANALYSES

The field work comprised residue, fluid, and wipe sample collection, monitoring well installation, and measurement of water/fluid levels and pH in the well, pickling tanks, and containment vault. All sampling and monitoring well installation activities were conducted in accordance with the HPA Safety Plan (*HLA, 1988*). Monitoring well installation and fluid sampling were conducted in accordance with procedures described in the Quality Assurance Project Plan (QAPP) (*HLA, 1987*). Methods for collection of residue samples and wipe samples are not addressed in the QAPP. However, sampling was performed in accordance with standard procedures.

2.1 Sample Collection

The zinc chromate residue samples (RES1, RES2, and RES3) were collected from the drying racks in the three locations. One fluid sample was collected from each of the three pickling tanks (PT1, PT2, and PT3) and from the containment vault (CV1). The wipe sample (WP1) was collected from a paint spot near building 420 and monitoring well PPY-1 was installed adjacent to the containment vault. All sample locations are shown on Plate 2.

The zinc chromate samples (RES1, RES2, and RES3) were collected by breaking off pieces of the residue on the drying racks with a clean gloved hand and chipping the residue with a decontaminated file. New gloves and a decontaminated file were used for the collection of each sample. The samples were placed directly into clean glass jars. Fluid samples from the pickling tanks (PT1, PT2, and PT3) and containment vault (CV1) were collected using a decontaminated stainless steel bailer and poured directly into the appropriate sample containers. Fluid levels in the pickling tanks and containment vault were measured in conjunction with the sampling activities in June 1989. The fluid

levels and pH of the fluid in the pickling tanks, the containment vault, and monitoring well PPY-1 were subsequently measured on September 21, 1989.

To collect the wipe sample (WP1), the paint spot was rinsed with deionized water to remove gravel and gross debris, the spot was allowed to dry, and a clean gauze pad was then soaked with hexane and used to wipe a 10 centimeter square area uniformly in one direction, then uniformly in a direction 90 degrees to the original direction. A small amount of hexane was added to the gauze pad and the wiping procedure was repeated. The gauze was then placed in the sample jar and labeled.

Following collection of each sample, the sample containers were capped tightly, the outsides of the containers were wiped clean, and the samples were sealed in Ziplock bags. The samples were placed in a cooler with blue ice and delivered to a laboratory courier under chain of custody. A copy of the signed chain of custody form is included in Attachment 1.

2.2 Monitoring Well Installation

Boring PPY-1 was drilled to a total depth of 17 feet below ground surface using a Failing FA-100 drill rig equipped with 8-inch outside diameter continuous flight hollow-stem augers. The well is located within 10 feet of the containment vault. Soil samples for visual classification were collected at 5-foot intervals with a split spoon sampler. The soil sample from each interval was visually examined for lithologic classification and then placed in a drum with the boring cuttings. The boring log and the key to the soil classification system are presented in Attachment 2.

A monitoring well was installed in Boring PPY-1 by inserting a 2-inch-diameter Schedule 40 polyvinyl chloride casing and screen with a bottom plug directly through the augers. To gravel pack the well, Monterey No. 3 sand was poured

through the augers as they were gradually removed from the boring. The sand was brought to the top of the perforations and a 2-foot-thick seal of bentonite was placed above the gravel pack after the augers were removed from the boring. The remainder of the annular space was filled with a cement and bentonite mixture to ground surface. A cap was placed at the wellhead and a Christy box was placed at ground surface to protect the wellhead. Monitoring well completion details are also included in Attachment 2. No soil or ground-water samples from Well PPY-1 were analyzed. However, the water level and pH of the water in the well was measured on September 21, 1989.

Soil from Boring PPY-1 was containerized in a 55-gallon drum. The drummed soil was subsequently sampled by Universal Engineering Incorporated to evaluate appropriate disposal methods.

2.3 Decontamination Procedures

The bailer used for the fluid sampling and the file used for the collection of zinc chromate residue samples were washed with a solution of tap water and laboratory grade detergent, then rinsed with deionized water between uses. The gloves used for the collection of the zinc chromate residue samples were changed between samples and subsequently placed in the drum with the boring cuttings for proper disposal.

2.4 Analytical Methods

The zinc chromate residue samples and fluid from the pickling tanks and containment vault were analyzed for the following parameters using the methods indicated:

Parameter	Analytical Method	Reference
Semivolatile Priority Pollutant Organic Compounds	8270/625	USEPA, 1986/ USEPA, 1982
ICAP Metals	6010	USEPA, 1986
Hexavalent Chromium	7196	USEPA, 1986
Total Petroleum Hydrocarbons (fluid only)	EXTN/GC-FID	LUFT
pH (water only)	150.1	USEPA, 1983

The wipe sample was analyzed for ICAP metals only.

3.0 RESULTS OF FIELD INVESTIGATION AND LABORATORY ANALYSES

3.1 Soil and Ground-Water Conditions

The soil samples from Boring PPY-1 were examined in the field for lithological description; the boring log is included in Attachment 2. As shown on the log, the boring encountered a gravelly sand from ground surface to the total depth of 17 feet below ground surface. The gravelly sand ranged from reddish brown to grayish brown and greenish brown in color. Clasts of gabbro and serpentine were locally observed in the sand. This gravelly sand is interpreted as bedrock fill material that underlies much of HPA. Ground water was encountered approximately 9.5 feet below ground surface in this boring.

3.2 Water Level and pH Measurement Results

Fluid levels and pH of the fluid measured in Monitoring Well PPY-1 and each of the tanks on September 21, 1989, are as follows. These fluid levels are corrected to represent approximate depth below ground surface.

	Depth to Fluid, Feet	pH
Monitoring Well PPY-1	8.7	6.1
Containment Vault	10.8	4.6
Pickling Tank 1	8.2	2.0
Pickling Tank 2	6.2	1.7*
Pickling Tank 3	8.4	2.5*

* measurement obtained on June 16, 1989

3.3 Analytical Results

Laboratory reports for each of the samples analyzed are included in Attachment 3 along with a key to the sample numbers. Laboratory analytical results are summarized in Tables 1 through 5. The reporting limits are laboratory reporting limits. These limits are the levels where the laboratory can accurately quantify the concentrations of a constituent if present, but are higher than the method detection limits. Therefore, concentrations reported between the method detection limit and the reporting limit are estimated. The laboratory did not provide method detection limits for the analyses performed.

3.3.1 Zinc Chromate Residue

Results of analysis for semivolatile organic compounds (SOCs) are summarized in Table 1. The samples contained detectable levels of several SOCs, primarily phenols, phthalates, and polynuclear aromatic hydrocarbons (PNAs). Many of the nonpriority pollutant SOCs were also tentatively identified in the residue samples; these data are not included on Table 1, but are contained in the laboratory reports in Attachment 3.

The results of the metals analyses of the zinc chromate residue samples are summarized in Table 2, with the Total Threshold Limit Concentrations (TTLCs) for metals in a solid waste. In accordance with section 66699 of Title 22 of the California Code of Regulations (22 CCR), a waste is considered hazardous if the total concentration of a metal exceeds the TTLC for that metal. As indicated in Table 2, each of the zinc chromate residue samples contained total chromium, lead, and zinc at concentrations greater than the respective TTLCs. Copper and barium were also identified at concentrations greater than their TTLCs in one of the samples.

3.3.2 Fluid Samples

Results of analysis for SOCs are summarized in Table 3. As indicated in the table, the samples contained detectable levels of only three SOCs. Each SOC was identified at a concentration of 2 micrograms per liter (μg/l). Several nonpriority pollutant SOCs were also tentatively identified in these samples. Concentrations of the tentatively identified nonpriority pollutants SOCs are included in the laboratory reports in Attachment 3.

Results of metals analyses of the tank and vault fluid samples are summarized in Table 4. As indicated in the table, samples from the pickling tanks and containment vault contained detectable levels of several metals. Results of analysis for total petroleum hydrocarbons (TPH) are summarized in Table 5. The fluid samples from Pickling Tanks 1 and 2 contained 410 and 160 μg/l of TPH. The hydrocarbon type found is characterized by the laboratory as weathered product which is lighter than diesel but heavier than gasoline.

The pH of the fluid in Pickling Tanks 1, 2, and 3 was 2.1, 0.9, and 1.5, respectively. The pH of the fluid in the containment vault was 5.3.

3.3.3 Wipe Sample

Results of metals analyses performed on the wipe sample (WP-1) are summarized in Table 6. Several metals were identified in this wipe sample.

4.0 DISCUSSION

The results of the sampling conducted at the Pickling and Plate Yard by HLA will be used in the preparation of the work plan for the planned removal actions at the Pickling and Plate Yard to evaluate appropriate disposal methods for the water and zinc chromate residue material. Results of the wipe sample analyses will be considered in evaluating whether the paint spot previously sampled by others should be included in the removal action. Analytical results for the zinc chromate samples will also be used in air modeling and a risk assessment that will be performed to evaluate potential health risks associated with sand blasting to remove the zinc chromate residue from the structures at the Pickling and Plate Yard.

5.0 REFERENCES

California Department of Health Services and State Water Resources Control Board, 1987. *Leaking Underground Fuel Tank (LUFT) Field Manual.* December 1987.

EMCON, 1987. *Confirmation Study Verification Step, Hunters Point Naval Shipyard (Disestablished), San Francisco, California.* Volumes I and II. March 19, 1987.

HLA, 1988. *Site Safety Plan, Naval Station Treasure Island, Hunters Point Annex, San Francisco, California.* April 14, 1988.

HLA, 1987. *Quality Assurance Project Plan (QAPP), Hunters Point Annex, San Francisco, California.* May 27, 1987.

USEPA 1982. *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, July 1982, EPA 600/4-82-057.

USEPA 1983. *Methods for Chemical Analyses of Water and Waste*, March 1983, EPA-600/4-79-020.

USEPA 1986. *Test Methods for Evaluating Solid Waste Physical/Chemical Methods*, SW846, 3rd Edition September 1986.

TABLES

Table 1
Zinc Chromate Residue Analytical Results, Semivolatile Organic Compounds
Pickling and Plate Yard

DRAFT

Date of Sample Collection: 6/16/89

Parameter	Sample Number RES1 8924D019 ug/kg	RES2 8924D020 ug/kg	RES3 8924D021 ug/kg
2-methylphenol	81 J	<1700	<20000
4-methylphenol	290 J	240 J	<20000
Isophorone	130 J	<1700	<20000
Naphthalene	300 J	<1700	<20000
Phenanthrene	130 J	300 J	<20000
Di-n-butylphthalate	220 J	660 J	2200 J
Fluoranthene	74 J	520 J	<20000
Pyrene	87 J	420 J	<20000
Butylbenzylphthalate	3100	16000	2200 J
Bis (2-ethylhexyl) phthalate	2000	2500	9300 J
Chrysene	81 J	270 J	<20000
Di-n-octylphthalate	110 J	<1700	<20000
Benzo (b) fluoranthene	100 J	<1700	<20000
Benzo (k) fluoranthene	100 J	<1700	<20000

Notes:

1. ug/kg = micrograms per kilogram (parts per million)
2. Method of analysis: EPA Test Method 8270
3. Detection limits indicated are laboratory reporting limits.
4. "J" indicates that concentration is less than laboratory reporting limit.
5. "<" refers to less than reporting limit shown.
6. Benzo (b) fluoranthene and benzo (k) fluoranthene are indistinguishable isomers.

Table 2
Zinc Chromate Residue Analytical Results, Metals
Pickling and Plate Yard

DRAFT

Date of Sample Collection: 6/16/89

	Sample Number			
	RES1	RES2	RES3	TTLC
	8924D019	8924D020	8924D021	
Parameter	mg/kg	mg/kg	mg/kg	mg/kg
Aluminum	2500	2500	5200	-
Arsenic	65	<10	<10	500
Barium	20000	390	1400	10000
Cadmium	24	50	29	100
Calcium	3200	4900	3700	-
Chromium, total	50000	53000	38000	2500
Chromium, hexavalent	190	430	91	500
Cobalt	57	100	96	8000
Copper	21000	2100	460	2500
Iron	10000	5600	20000	-
Lead	4600	4600	3500	1000
Magnesium	11000	7100	58	-
Manganese	280	180	250	-
Nickel	71	52	290	2000
Potassium	17000	19000	13000	-
Sodium	600	1100	760	-
Zinc	120000	130000	93000	5000

Notes:

1. mg/kg = milligrams per kilogram (parts per million).
   mg/l = milligrams per liter (parts per million).

2. Method of anlysis: ICAP metals by EPA method 6010 plus hexavalent chromium by EPA Method 7196.

3. STLC: Soluble Threshold Limit Concentration, Title 22, California Administrative Code, Section 66699, expressed in miligrams per liter

4. TTLC: Total Threshold Limit Concentration, Title 22, California Administrative Code, Section 66699.

5. Concentrations exceeding TTLC are underlined.

6. "<" refers to less than the reporting limit shown.

Table 3
Pickling Tank and Containment Vault Liquid Analytical Results,
Semivolatile Organic Compounds
Pickling and Plate Yard

DRAFT

Date of Sample Collection: 6/16/89

	Sample Number			
	PT-1	PT-2	PT-3	CV-1
	8924D015	8924D016	8924D017	8924D018
Parameter	ug/l	ug/l	ug/l	ug/l
1,2,4-trichlorobenzene	<10	<10	<10	<10
Butylbenzylphthalate	<50	2 J	<50	<50
Bis (2-ethylhexyl) phthalate	2 J	2 J	2 J	<50

Notes:

1. ug/l = micrograms per liter (parts per billion).
2. Method of analysis: EPA Method 625.
3. Detection limits indicated are laboratory reporting limits.
4. "J" indicates that concentration is less than laboratory reporting limit.
5. "<" refers to less than reporting limit shown.

DRAFT

Table 4
Pickling Tank and Containment Vault Liquid Analytical Results, Metals
Pickling and Plate Yard

Date of Sample Collection: 6/16/89

	Sample Number			
	PT-1	PT-2	PT-3	CV-1
	8924D015	8924D016	8924D017	8924D018
Parameter	mg/l	mg/l	mg/l	mg/l
Aluminum	110	90	300	1
Boron	0.2	2.1	2	0.1
Calcium	120	27	73	190
Chromium, total	230	6.8	320	0.44
Chromium, hexavalent	INT	INT	INT	<0.5
Cobalt	<0.05	<0.05	0.19	<0.05
Copper	3.1	0.88	32	0.21
Iron	120	2800	2500	65
Lead	0.5	3.6	4.1	0.3
Magnesium	20	24	90	7.5
Manganese	4.1	12	29	0.21
Nickel	1.2	1.8	2.3	<0.05
Potassium	14	18	34	13
Selenium	220	2.5	2.2	<0.2
Sodium	<2.5	21	64	63
Vanadium	<0.25	0.56	0.55	<0.05
Zinc	4.2	3.4	23	0.58

Notes:

1. Concentration given in milligrams per liter.
2. INT: Constituent could not be identified because of interference due to color of sample.
3. Method of analysis: ICAP metals by EPA Method 6010 and hexavalent chromium by EPA Method 7196.
4. "<" refers to less than the reporting limit shown.

Table 5
Pickling Tank and Containment Vault Liquid Analytical Results,
Total Petroleum Hydrocarbons
Pickling and Plate Yard

DRAFT

Date of Sample Collection: 6/16/89

	Sample Number			
	PT-1	PT-2	PT-3	CV-1
	8924D015	8924D016	8924D017	8924D018
Parameter	ug/l	ug/l	ug/l	ug/l
Total Petroleum Hydrocarbons	<100	410	160	<100
Hydrocarbon Type	-	Unknown	Unknown	-

Notes:

1. ug/l = micrograms per liter (parts per billion).
2. Methods of Analyses:

   Oil and Grease by EPA Test Method 413.2
   Total Petroleum Hydrocarbons by EPA Test Method 8015 .
3. Unknown hydrocarbon type is heavier than gasoline and lighter than diesel. It may be an altered or weathered intermediate grade.
4. "<" refers to less than the reporting limit shown.

Table 6
Wipe Sample Analytical Results, Metals
Pickling and Plate Yard

DRAFT

Date of Sample Collection: 6/6/16

Parameter	WP-1 8924D022 mg/l
Aluminum	14
Antimony	0.5
Barium	2
Cadmium	0.03
Calcium	120
Chromium, total	11
Chromium, hexavalent	<0.5
Cobalt	0.12
Copper	2
Iron	34
Lead	53
Magnesium	9.5
Manganese	1.4
Nickel	0.28
Potassium	4.2
Sodium	7
Vanadium	0.09
Zinc	31

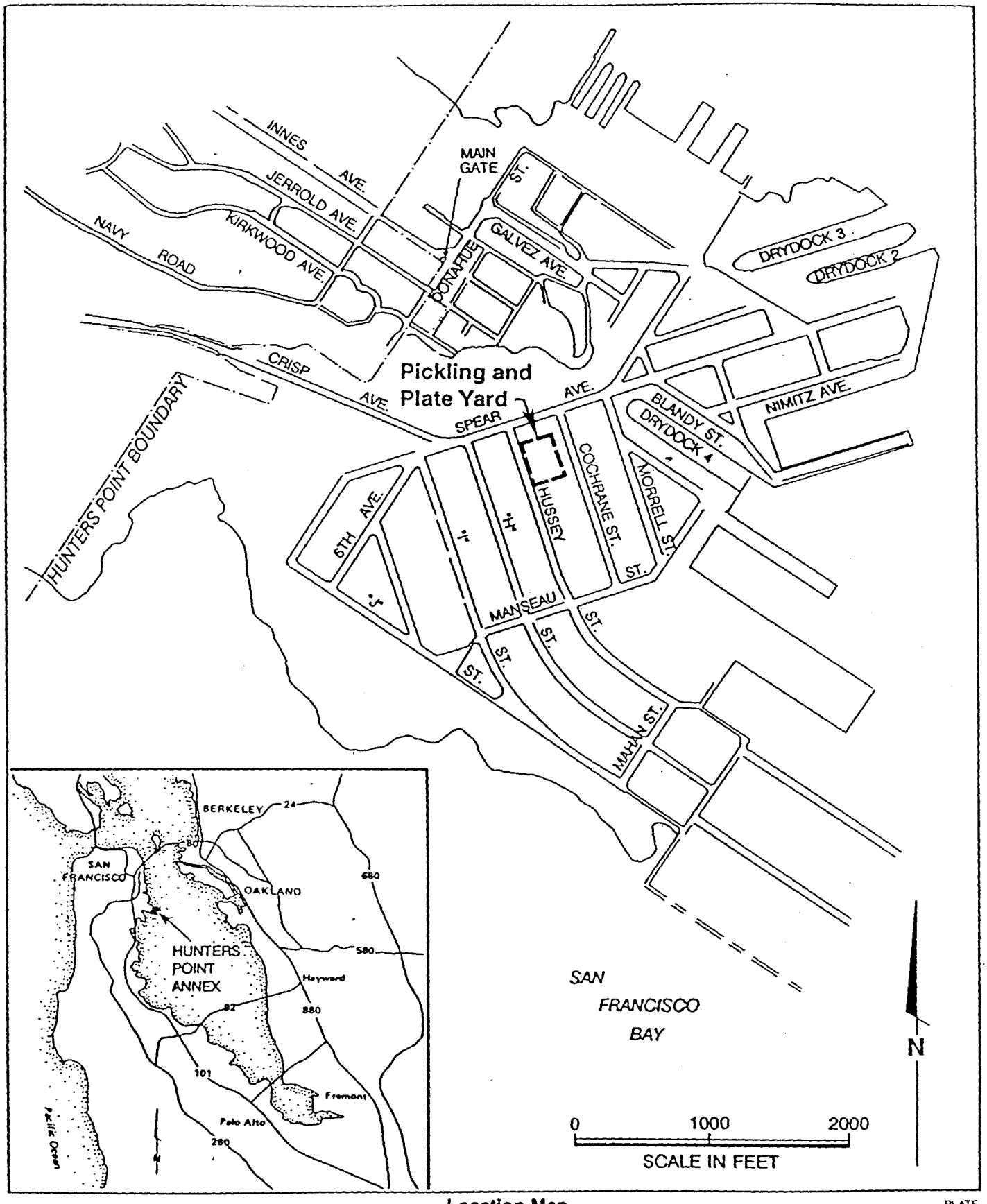
Notes:

1. mg/l = milligrams per liter (parts per million).
2. Method of analysis: ICAP metals by EPA Method 6010
   hexavalent chromium by EPA Method 7196
3. "<" refers to less than reporting limit shown.

DRAFT

ILLUSTRATIONS

14596



Harding Lawson Associates
Engineers and Geoscientists

Location Map
Pickling and Plate Yard
Hunters Point Annex
San Francisco, California

DRAFT

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	2176,245.02		9/89		

APPENDIX B – SAMPLING AT THE PICKLING AND PLATE YARD

PLATE 2 – SITE MAP

REMOVAL ACTION FOR PICKLING AND PLATE YARD WORK PLAN

THE ABOVE IDENTIFIED MAP IS NOT AVAILABLE.

EXTENSIVE RESEARCH WAS PERFORMED BY SOUTHWEST DIVISION TO LOCATE THIS MAP. THIS PAGE HAS BEEN INSERTED AS A PLACEHOLDER AND WILL BE REPLACED SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

DIANE C. SILVA
RECORDS MANAGEMENT SPECIALIST
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676

Attachment 1

CHAIN OF CUSTODY FORM

Harding Lawson Associates
7655 Redwood Blvd.
P.O. Box 578
Novato, CA 94948
(415) 892-0821

HUNTERS POINT ANNEX

CHAIN OF CUSTODY FORM

Chem West
Non-CLP

Samplers: Dave O'Rourke

Job Number: 176.245.02

Name/Location: Hunters Point

Project Manager: Lisa Teague

Recorder: Dave O'Rourke (Signature Required)

SOURCE CODE	MATRIX: precipitate	Water	Sediment	Soil	Oil	Wipe	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES
35		X					3		1	89	24	D01 5	89	06	16	0930	
35		X					3		1	89	24	D01 6	89	06	16	1000	
35		X					3		1	89	24	D01 7	89	06	16	1045	
35		X					4		1	89	24	D01 8	89	06	16	1115	* Do not run TPH EXTN & pH on DO 19, DO 20, DO 21 per Kit Richards See attached memo. BMc
00	X						1			89	24	D01 9	89	06	16	1130	
00	X						1			89	24	D020	89	06	16	1145	
00	X						1			89	24	D021	89	06	16	1200	
00						X	1			89	24	D022	89	06	16	1215	

ANALYSIS REQUESTED

CLP VOC	SOC 8270 or 625	CLP Pest/PCBs	Metals incl. Cr+6 (TTLC)	CLP Cyanide	TPH extractable	HLA Reporting	BETX	Oil & Grease (9070 9071)	TPH (Gasoline & Diesel)	pH	Anions (3000)	TDS	8010	8020	Asbestos
	X		X		X					X					
	X		X		X					X					
	X		X		X					X					
	X		X		X					X					
	X		X		X					X					
	X		X		X					X					
	X		X		X					X					
	X		X		X					X					
			X												

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
Dave O'Rourke	GARY BIASE Gary Biase	6-16-89 1305
RELINQUISHED BY: (Signature) GARY BIASE Gary Biase	RECEIVED BY: (Signature)	DATE/TIME 6-16-89 1745
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature) BILL McBENGE Bill McBenge	DATE/TIME 6/16/89 17:45
METHOD OF SHIPMENT CHEM WEST COURIER		

Laboratory Copy Project Office Copy Field or Office Copy

6533

CHEMWEST
ANALYTICAL LABORATORIES, INC.

MEMO TO: Bill McEnery/ Troy Calloway

FROM Margie Nambu

SUBJECT: HLA

DATE: 6-16-89

Per conversation w/ Kit Richards, HLA

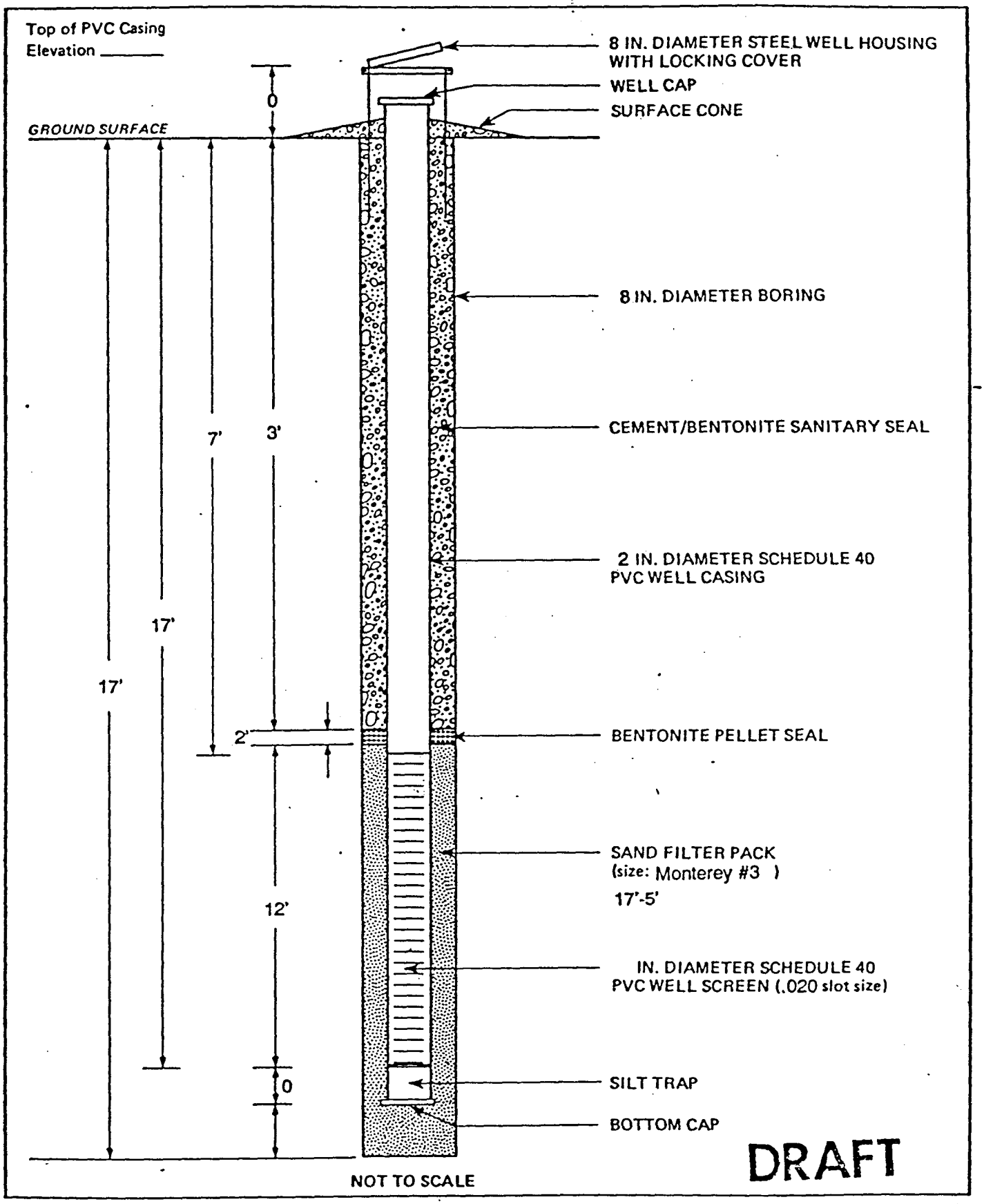
D019
D020
D021
} Do NOT do TPH extn and pH

600W North Market Boulevard • Sacramento, CA 95834 • Phone (916) 923-0840 • FAX (916) 923-1938

A Subsidiary of CompuChem Corporation

Attachment 2

BORING LOG



Harding Lawson Associates
Engineers, Geologists & Geophysicists

Well Completion Detail
Hunters Point Annex
San Francisco, California

PLATE
B-3

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	02176,245.02		10/89		

FORM GW1

Attachment 3

LABORATORY ANALYTICAL REPORTS

Key to samples:

Sample Number	Sample Type	Sample ID	Sample Location
8924DO15	Water	PT1	Pickling Tank 1
8924DO16	Water	PT2	Pickling Tank 2
8924DO17	Water	PT3	Pickling Tank 3
8924DO18	Water	CV1	Containment Vault
8924DO19	Residue	RES1	Drying Racks
8924DO20	Residue	RES2	Drying Racks
8924DO21	Residue	RES3	Drying Racks
8924DO22	Wipe	WP1	Paint Spot

CHEMWEST
ANALYTICAL LABORATORIES, INC.

August 18, 1989

Harding Lawson Associates
200 Rush Landing Road
Novato, CA 94948

Attention: Ms. Mary Lucas

Subject: Report of Data - Case Number 4053

Dear Ms. Lucas:

The technical staff at CHEMWEST is pleased to provide our report for the analyses you requested: Semivolatile Organics - EPA Methods 8270/625; TPH EXTN/GC-FID - DOHS Luft Field Method; ICAP Metals - EPA Method 6010; EPA Method 200.7, including Hexavalent Chromium - EPA Method 7196; and pH - EPA Method 150.1.

Eight samples (4 waters, 3 precipitates, and 1 wipe) for Project Hunters Point, Project Number 2176.245.02 were received June 16, 1989 in good condition.

We were unable to analyze for Hexavalent Chromium in Client ID's 8924D015, 16, and 17, CHEMWEST ID's 4053-1, -2, and -3 respectively, due to colored interferences in the samples. Client ID 8924D022/CW #4053-8 was received as a wipe, reporting units are mg/L. The wipe (gauze) sample was dropped into a flask with 100 mls of acidified deionized water and placed on a shaker for twenty-four hours. After shaking it was then filtered, reacidified and analyzed as a water.

Please note that the surrogate recoveries for the above listed ID's for the semivolatile fraction, fell outside quality control limits in both the original and repeated extractions. Results were comparable between the two analyses. Since all other QC criteria associated with these analysis were met, the unacceptable surrogate recoveries have been attributed to the particular sample matrix, rather than to deficiencies in the laboratory's analytical system. Sample 8924D021/CW # 4053-7 was extracted as medium level with a nominal increase of 60 for the detection limit over a low level.

Surrogates:

Surrogates were included in all samples. Surrogates are used to monitor extractions recovery efficiency.

	% EPA Allowable Recovery	
Surrogate Compounds	Water	Soil
Nitrobenzene-d5	35 - 114	23 - 120
2-Fluorobiphenyl	43 - 116	30 - 115
p-Terphenyl-d14	33 - 141	18 - 147
Phenol-d5	10 - 94	24 - 113
2-Fluorophenol	21 - 100	25 - 121
2,4,6-Tribromophenol	10 - 123	19 - 122

Matrix Spikes:

Matrix spikes are additional quality assurance controls. Known amounts of selected compounds are added to samples and analytical accuracy is determined by sample analysis.

	% EPA Allowable Recovery	
Matrix Spike Compounds	Water	Soil
1,2,4-Trichlorobenzene	39 - 98	38 - 107
Acenaphthene	46 - 118	31 - 137
2,4-Dinitrotoluene	24 - 96	28 - 89
Pyrene	26 - 127	35 - 142
N-Nitroso-di-n-propylamine	41 - 116	41 - 126
1,4-Dichlorobenzene	36 - 97	28 - 104
Pentachlorophenol	9 - 103	17 - 109
Phenol	12 - 89	26 - 90
2-Chlorophenol	27 - 123	25 - 102
4-Chloro-3-methylphenol	23 - 97	26 - 103
4-Nitrophenol	10 - 80	11 - 114

ANALYTICAL METHODOLOGY

Total Petroleum Hydrocarbons (TPH) Extractables by GC-FID

Extraction Procedure:

WATER - Luft Field Manual

A 1 liter sample is poured into a 2 liter separatory funnel. 3x100 ml extractions with methylene chloride (2 minute shake outs) are completed. The methylene chloride is decanted off and concentrated to a 5 ml final volume.

SOIL - Luft Field Manual

A 30 gram, or other appropriate aliquot of soil, is mixed with 10 grams of washed sodium sulfate. 100 mls of methylene chloride is added to the soil and placed on a mechanical shaker for 1 hour. The liquid is decanted off and the process is repeated with an additional 50 ml of methylene chloride. The combined solvent extracts are filtered through sodium sulfate and the extract is concentrated to a 5 ml final volume.

GC ANALYSIS -

An appropriate volume of the sample extract is injected into a Gas Chromatograph equipped with a Flame Ionization Detector (FID), a split/ splitless capillary injector (operated in the splitless mode), and a fused silica capillary column. The TPH fraction is quantitated as gasoline and/or #2 diesel fuel (and/or different petroleum hydrocarbon fuel types if requested, such as JP-4 jet fuel) based on relative retention times and examination of the elution profile. The TPH fraction quantitation is based on chromatographic peak areas against a multipoint standard curve.

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D015
Date Extracted: 06/21/89
Date Analyzed : 06/21/89

CHEMWEST I.D.: 4053-1
Matrix: Water

Compound	Amount Detected (ug/L)	DL (ug/L)
Phenol	BDL	10
2-Chlorophenol	BDL	10
bis(2-Chloroethyl) ether	BDL	20
1,3-Dichlorobenzene	BDL	10
1,4-Dichlorobenzene	BDL	10
1,2-Dichlorobenzene	BDL	10
Benzyl alcohol	BDL	10
2-Methylphenol	BDL	10
bis(2-Chloroisopropyl) ether	BDL	10
Hexachloroethane	BDL	10
N-Nitroso-di-n-propylamine	BDL	10
4-Methylphenol	BDL	10
Nitrobenzene	BDL	10
Isophorone	BDL	10
2-Nitrophenol	BDL	10
2,4-Dimethylphenol	BDL	10
bis(2-Chloroethoxy) methane	BDL	10
2,4-Dichlorophenol	BDL	10
1,2,4-Trichlorobenzene	BDL	10
Benzoic acid	BDL	100
Naphthalene	BDL	10
4-Chloroaniline	BDL	10
Hexachlorobutadiene	BDL	10
4-Chloro-3-methylphenol	BDL	10
2-Methylnaphthalene	BDL	10
Hexachlorocyclopentadiene	BDL	10
2,4,6-Trichlorophenol	BDL	20
2,4,5-Trichlorophenol	BDL	20
2-Chloronaphthalene	BDL	10
2-Nitroaniline	BDL	20
Acenaphthylene	BDL	10
Dimethylphthalate	BDL	50
2,6-Dinitrotoluene	BDL	10
3-Nitroaniline	BDL	20
Acenaphthene	BDL	10
2,4-Dinitrophenol	BDL	40
Dibenzofuran	BDL	10
4-Nitrophenol	BDL	20
2,4-Dinitrotoluene	BDL	10
Fluorene	BDL	10
4-Chlorophenyl-phenylether	BDL	10
Diethylphthalate	BDL	50
4-Nitroaniline	BDL	20
4,6-Dinitro-2-methylphenol	BDL	30

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D015 CHEMWEST I.D.: 4053-1

Compound	Amount Detected (ug/L)	DL (ug/L)
N-Nitrosodiphenylamine (1)	BDL	10
4-Bromophenyl-phenylether	BDL	10
Hexachlorobenzene	BDL	10
Pentachlorophenol	BDL	20
Phenanthrene	BDL	10
Anthracene	BDL	10
Di-n-butylphthalate	BDL	50
Fluoranthene	BDL	10
Pyrene	BDL	10
Butylbenzylphthalate	BDL	50
Benzo(a)anthracene	BDL	10
3,3'-Dichlorobenzidine	BDL	20
Chrysene	BDL	10
bis(2-Ethylhexyl)phthalate	2 J	50
Di-n-octylphthalate	BDL	50
Benzo(b)fluoranthene	BDL	10
Benzo(k)fluoranthene	BDL	10
Benzo(a)pyrene	BDL	10
Indeno(1,2,3-cd)pyrene	BDL	10
Dibenz(a,h)anthracene	BDL	10
Benzo(g,h,i)perylene	BDL	10

Surrogates	% Recovery	Acceptance Window
2-Fluorophenol	6% *	21-100%
Phenol-d5	6% *	10- 94%
Nitrobenzene-d5	87%	35-114%
2-Fluorobiphenyl	73%	43-116%
2,4,6-Tribromophenol	19%	10-123%
Terphenyl-d14	97%	33-141%

BDL: Below Detection Limit.
DL: Detection Limit.

J - Estimated concentration of analyte which is present but at a concentration less than the stated detection limit.
(1): Cannot be separated from diphenylamine.
*: Please see Cover Letter.

Approved by: _____ REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
TENTATIVELY IDENTIFIED SEMIVOLATILE COMPOUNDS

Client I.D.: 8924D015
Date Analyzed: 06/21/89

CHEMWEST I.D.: 4053-1
Matrix : Water

Compound	Estimated Conc. (ug/L)	
Nickel, [(1,4,5-.ETA.)-4-Cycloocten-1-YL](2,4-Penta (Unknown)	5	J
Benzothiazole, 2-Phenyl- (Unknown)	2	J
5.Alpha.-Spirostan, 23-Bromo-,(22S,23R,25R)- (Unknown)	3	J
Phosphonic Acid, Dioctadecyl Ester (Unknown)	9	J
Retinol, Acetone (Unknown)	22	J
3-Hexene, 2,2,5,5-Tetramethyl-, (Z)- (Unknown)	25	J
2-Heptanol,5-Ethyl- (Unknown)	12	J
1,2-Cyclohexanediol, Cyclicsulfite, Cis- (Unknown)	10	J
1-Heptanol, 6-Methyl- (Unknown)	7	J
Unknown (Unknown)	12	J

J - Indicates an estimated concentration which is determined assuming a 1:1 response.

Approved by: _____

REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D016
Date Extracted: 06/20/89
Date Analyzed : 06/21/89

CHEMWEST I.D.: 4053-2
Matrix: Water

Compound	Amount Detected (ug/L)	DL (ug/L)
Phenol	BDL	10
2-Chlorophenol	BDL	10
bis(2-Chloroethyl) ether	BDL	20
1,3-Dichlorobenzene	BDL	10
1,4-Dichlorobenzene	BDL	10
1,2-Dichlorobenzene	BDL	10
Benzyl alcohol	BDL	10
2-Methylphenol	BDL	10
bis(2-Chloroisopropyl) ether	BDL	10
Hexachloroethane	BDL	10
N-Nitroso-di-n-propylamine	BDL	10
4-Methylphenol	BDL	10
Nitrobenzene	BDL	10
Isophorone	BDL	10
2-Nitrophenol	BDL	10
2,4-Dimethylphenol	BDL	10
bis(2-Chloroethoxy) methane	BDL	10
2,4-Dichlorophenol	BDL	10
1,2,4-Trichlorobenzene	BDL	10
Benzoic acid	BDL	100
Naphthalene	BDL	10
4-Chloroaniline	BDL	10
Hexachlorobutadiene	BDL	10
4-Chloro-3-methylphenol	BDL	10
2-Methylnaphthalene	BDL	10
Hexachlorocyclopentadiene	BDL	10
2,4,6-Trichlorophenol	BDL	20
2,4,5-Trichlorophenol	BDL	20
2-Chloronaphthalene	BDL	10
2-Nitroaniline	BDL	20
Acenaphthylene	BDL	10
Dimethylphthalate	BDL	50
2,6-Dinitrotoluene	BDL	10
3-Nitroaniline	BDL	20
Acenaphthene	BDL	10
2,4-Dinitrophenol	BDL	40
Dibenzofuran	BDL	10
4-Nitrophenol	BDL	20
2,4-Dinitrotoluene	BDL	10
Fluorene	BDL	10
4-Chlorophenyl-phenylether	BDL	10
Diethylphthalate	BDL	50
4-Nitroaniline	BDL	20
4,6-Dinitro-2-methylphenol	BDL	30

CHEMWEST ANALYTICAL LABORATORIES
TENTATIVELY IDENTIFIED SEMIVOLATILE COMPOUNDS

Client I.D.: 8924D016
Date Analyzed: 06/21/89

CHEMWEST I.D.: 4053-2
Matrix: Water

Compound	Estimated Conc. (ug/L)
Bicyclo[2.2.1]Hpeta-2,5-Dien-7-01 (Unknown)	1000 J
Benzenamine,2,6-Dimethyl	20 J
2,4(3H,5H)-Furandione,3-,Methyl)- (Unknown)	10 J
Hyantoin,1-Butyl- (Unknown)	51 J
1,4-Benzenediol,2-Methyl-	15 J
5-Quinolinamine	22 J
4-Heptanone,Semicarbazone (Unknown)	14 J
Hexanedioic Acid,Monoethyl Ester (Unknown)	13 J
Phenol,4-(Dimethylamino)-3,5-Dimethyl- (Unknown)	18 J
5-Undecanol,2-Methyl- (Unknown)	110 J
2-Butanone,3,4-Epoxy-3-Ethyl- (Unknown)	13 J
Ethanol,2-[2-(2-Phenoxyethoxy)Ethoxy]- (Unknown)	10 J
Phosphoric Acid Tributyl Ester (Unknown)	16 J
1H-Pyrazole,4,5-Dihydrro-1-(4-Methylphenyl)-3-Phenyl (Unknown)	1100 J
Quinoxaline,2-Ethyl-3-Phenyl-,4-Oxide (Unknown)	48 J
Benzenamine,N,N'-1,2-Ethanediylidenebis[4-Methoxy- (Unknown)	110 J
4H-1-Benzopyran-4-One,2,3-Dihydro-2-(4-Methoxyphenyl (Unknown)	15 J
Cyclopropanecarbonitrile,1-(4-Chlorophenyl)-2[(Dim (Unknown)	23 J
Ethene,(Methylsulfonyl)-	11 J

J - Indicates an estimated concentration which is determined assuming a 1:1 response.

Approved by: _____ REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D017
Date Extracted: 06/20/89
Date Analyzed : 06/21/89

CHEMWEST I.D.: 4053-3
Matrix: Water

Compound	Amount Detected (ug/L)	DL (ug/L)
Phenol	BDL	10
2-Chlorophenol	BDL	10
bis(2-Chloroethyl) ether	BDL	20
1,3-Dichlorobenzene	BDL	10
1,4-Dichlorobenzene	BDL	10
1,2-Dichlorobenzene	BDL	10
Benzyl alcohol	BDL	10
2-Methylphenol	BDL	10
bis(2-Chloroisopropyl) ether	BDL	10
Hexachloroethane	BDL	10
N-Nitroso-di-n-propylamine	BDL	10
4-Methylphenol	BDL	10
Nitrobenzene	BDL	10
Isophorone	BDL	10
2-Nitrophenol	BDL	10
2,4-Dimethylphenol	BDL	10
bis(2-Chloroethoxy) methane	BDL	10
2,4-Dichlorophenol	BDL	10
1,2,4-Trichlorobenzene	BDL	10
Benzoic acid	BDL	100
Naphthalene	BDL	10
4-Chloroaniline	BDL	10
Hexachlorobutadiene	BDL	10
4-Chloro-3-methylphenol	BDL	10
2-Methylnaphthalene	BDL	10
Hexachlorocyclopentadiene	BDL	10
2,4,6-Trichlorophenol	BDL	20
2,4,5-Trichlorophenol	BDL	20
2-Chloronaphthalene	BDL	10
2-Nitroaniline	BDL	20
Acenaphthylene	BDL	10
Dimethylphthalate	BDL	50
2,6-Dinitrotoluene	BDL	10
3-Nitroaniline	BDL	20
Acenaphthene	BDL	10
2,4-Dinitrophenol	BDL	40
Dibenzofuran	BDL	10
4-Nitrophenol	BDL	20
2,4-Dinitrotoluene	BDL	10
Fluorene	BDL	10
4-Chlorophenyl-phenylether	BDL	10
Diethylphthalate	BDL	50
4-Nitroaniline	BDL	20
4,6-Dinitro-2-methylphenol	BDL	30

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D017 CHEMWEST I.D.: 4053-3

Compound	Amount Detected (ug/L)	DL (ug/L)
N-Nitrosodiphenylamine (1)	BDL	10
4-Bromophenyl-phenylether	BDL	10
Hexachlorobenzene	BDL	10
Pentachlorophenol	BDL	20
Phenanthrene	BDL	10
Anthracene	BDL	10
Di-n-butylphthalate	BDL	50
Fluoranthene	BDL	10
Pyrene	BDL	10
Butylbenzylphthalate	BDL	50
Benzo(a)anthracene	BDL	10
3,3'-Dichlorobenzidine	BDL	20
Chrysene	BDL	10
bis(2-Ethylhexyl)phthalate	2 J	50
Di-n-octylphthalate	BDL	50
Benzo(b)fluoranthene	BDL	10
Benzo(k)fluoranthene	BDL	10
Benzo(a)pyrene	BDL	10
Indeno(1,2,3-cd)pyrene	BDL	10
Dibenz(a,h)anthracene	BDL	10
Benzo(g,h,i)perylene	BDL	10

Surrogates	% Recovery	Acceptance Window
2-Fluorophenol	1% *	21-100%
Phenol-d5	1% *	10- 94%
Nitrobenzene-d5	67%	35-114%
2-Fluorobiphenyl	60%	43-116%
2,4,6-Tribromophenol	1% *	10-123%
Terphenyl-d14	90%	33-141%

BDL: Below Detection Limit.
DL: Detection Limit.

J - Estimated concentration of analyte which is present but at a concentration less than the stated detection limit.
(1): Cannot be separated from diphenylamine.
*: Please see Cover Letter.

Approved by: _____

CHEMWEST ANALYTICAL LABORATORIES
TENTATIVELY IDENTIFIED SEMIVOLATILE COMPOUNDS

Client I.D.: 8924D017 CHEMWEST I.D.: 4053-3
Date Analyzed: 06/21/89 Matrix: Water

Compound	Estimated Conc. (ug/L)
2,2'-Biquinoline (Unknown)	4 J
Phenol,4-(2-Aminoethyl)- (Unknown)	5 J
2,6,10-Dodecatrien-1-01,3,7,11-Trimethyl- (Unknown)	5 J
2-Butanol,2,3-Dimethyl- (Unknown oxygenated hydrocarbon)	8 J
3-Hexene,2,2-Dimethyl-,(Z)- (Unknown)	8 J
3-Hexene,2,2,5,5-Tetramethyl-,(Z)- (Unknown)	24 J
1-Octanol (Unknown)	15 J
Ethene,(Methylsulfonyl)-	14 J
2-Hexene,3,4,4-Trimethyl- (Unknown alkene)	10 J

J - Indicates an estimated concentration which is determined assuming a 1:1 response.

Approved by: REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D018
Date Extracted: 06/20/89
Date Analyzed : 06/20/89

CHEMWEST I.D.: 4053-4
Matrix: Water

Compound	Amount Detection (ug/L)	DL (ug/L)
Phenol	BDL	10
2-Chlorophenol	BDL	10
bis(2-Chloroethyl) ether	BDL	20
1,3-Dichlorobenzene	BDL	10
1,4-Dichlorobenzene	BDL	10
1,2-Dichlorobenzene	BDL	10
Benzyl alcohol	BDL	10
2-Methylphenol	BDL	10
bis(2-Chloroisopropyl) ether	BDL	10
Hexachloroethane	BDL	10
N-Nitroso-di-n-propylamine	BDL	10
4-Methylphenol	BDL	10
Nitrobenzene	BDL	10
Isophorone	BDL	10
2-Nitrophenol	BDL	10
2,4-Dimethylphenol	BDL	10
bis(2-Chloroethoxy) methane	BDL	10
2,4-Dichlorophenol	BDL	10
1,2,4-Trichlorobenzene	BDL	10
Benzoic acid	BDL	100
Naphthalene	BDL	10
4-Chloroaniline	BDL	10
Hexachlorobutadiene	BDL	10
4-Chloro-3-methylphenol	BDL	10
2-Methylnaphthalene	BDL	10
Hexachlorocyclopentadiene	BDL	10
2,4,6-Trichlorophenol	BDL	20
2,4,5-Trichlorophenol	BDL	20
2-Chloronaphthalene	BDL	10
2-Nitroaniline	BDL	20
Acenaphthylene	BDL	10
Dimethylphthalate	BDL	50
2,6-Dinitrotoluene	BDL	10
3-Nitroaniline	BDL	20
Acenaphthene	BDL	10
2,4-Dinitrophenol	BDL	40
Dibenzofuran	BDL	10
4-Nitrophenol	BDL	20
2,4-Dinitrotoluene	BDL	10
Fluorene	BDL	10
4-Chlorophenyl-phenylether	BDL	10
Diethylphthalate	BDL	50
4-Nitroaniline	BDL	20
4,6-Dinitro-2-methylphenol	BDL	30

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D018 CHEMWEST I.D.: 4053-4

Compound	Amount Detected (ug/L)	DL (ug/L)
N-Nitrosodiphenylamine (1)	BDL	10
4-Bromophenyl-phenylether	BDL	10
Hexachlorobenzene	BDL	10
Pentachlorophenol	BDL	20
Phenanthrene	BDL	10
Anthracene	BDL	10
Di-n-butylphthalate	BDL	50
Fluoranthene	BDL	10
Pyrene	BDL	10
Butylbenzylphthalate	BDL	50
Benzo(a)anthracene	BDL	10
3,3'-Dichlorobenzidine	BDL	20
Chrysene	BDL	10
bis(2-Ethylhexyl)phthalate	BDL	50
Di-n-octylphthalate	BDL	50
Benzo(b)fluoranthene	BDL	10
Benzo(k)fluoranthene	BDL	10
Benzo(a)pyrene	BDL	10
Indeno(1,2,3-cd)pyrene	BDL	10
Dibenz(a,h)anthracene	BDL	10
Benzo(g,h,i)perylene	BDL	10

Surrogates	% Recovery	Acceptance Window
2-Fluorophenol	70%	21-100%
Phenol-d5	69%	10- 94%
Nitrobenzene-d5	89%	35-114%
2-Fluorobiphenyl	82%	43-116%
2,4,6-Tribromophenol	118%	10-123%
Terphenyl-d14	139%	33-141%

BDL: Below Detection Limit.
DL: Detection Limit.

(1): Cannot be separated from diphenylamine.

Approved by: AJ

REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
TENTATIVELY IDENTIFIED SEMIVOLATILE COMPOUNDS

Client I.D.: 8924D018 | CHEMWEST I.D.: 4053-4
Date Analyzed: 06/20/89 | Matrix : Water

Compound	Estimated Conc. (ug/L)
Nonacosane,3-Methyl- (Unknown)	4 J
4H-Pyrido[1,2-A]Pyrimidine-3-Carboxylic Acid,6,7,8 (Unknown)	7 J
1H-Pyrazole,4,5-Dihydro-3(4-Methylphenyl)-Phenyl (Unknown)	24 J
Methaqualone (USAN) (Unknown)	3 J
Thiazole,4-(Chloromethyl)-2-(4-Chloro-3-Nitrophenyl (Unknown)	14 J

J - Indicates an estimated concentration which is determined assuming a 1:1 response.

Approved by: _____ REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D019
Date Extracted: 06/19/89
Date Analyzed : 06/22/89

CHEMWEST I.D.: 4053-5
Matrix: Precipitate
Amount Extracted: 30.0g
Dry Weight Factor 1.01

Compound	Amount Detected (ug/Kg)	DL * (ug/Kg)
Phenol	BDL	670
2-Chlorophenol	BDL	670
bis(2-Chloroethyl) ether	BDL	1300
1,3-Dichlorobenzene	BDL	670
1,4-Dichlorobenzene	BDL	670
1,2-Dichlorobenzene	BDL	670
Benzyl alcohol	BDL	670
2-Methylphenol	81 J	670
bis(2-Chloroisopropyl) ether	BDL	670
Hexachloroethane	BDL	670
N-Nitroso-di-n-propylamine	BDL	670
4-Methylphenol	290 J	670
Nitrobenzene	BDL	670
Isophorone	130 J	670
2-Nitrophenol	BDL	670
2,4-Dimethylphenol	BDL	670
bis(2-Chloroethoxy) methane	BDL	670
2,4-Dichlorophenol	BDL	670
1,2,4-Trichlorobenzene	BDL	670
Benzoic acid	BDL	6700
Naphthalene	300 J	670
4-Chloroaniline	BDL	670
Hexachlorobutadiene	BDL	670
4-Chloro-3-methylphenol	BDL	670
2-Methylnaphthalene	BDL	670
Hexachlorocyclopentadiene	BDL	670
2,4,6-Trichlorophenol	BDL	1300
2,4,5-Trichlorophenol	BDL	1300
2-Chloronaphthalene	BDL	670
2-Nitroaniline	BDL	670
Acenaphthylene	BDL	670
Dimethylphthalate	BDL	670
2,6-Dinitrotoluene	BDL	670
3-Nitroaniline	BDL	1300
Acenaphthene	BDL	670
2,4-Dinitrophenol	BDL	2700
Dibenzofuran	BDL	670
4-Nitrophenol	BDL	670
2,4-Dinitrotoluene	BDL	670
Fluorene	BDL	670
4-Chlorophenyl-phenylether	BDL	670
Diethylphthalate	BDL	670
4-Nitroaniline	BDL	1300
4,6-Dinitro-2-methylphenol	BDL	2000

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D019

CHEMWEST I.D.: 4053-5
Matrix: Precipitate

Compound	Amount Detected (ug/Kg)	DL * (ug/Kg)
N-Nitrosodiphenylamine (1)	BDL	670
4-Bromophenyl-phenylether	BDL	670
Hexachlorobenzene	BDL	670
Pentachlorophenol	BDL	1300
Phenanthrene	130 J	670
Anthracene	BDL	670
Di-n-butylphthalate	220 J	670
Fluoranthene	74 J	670
Pyrene	87 J	670
Butylbenzylphthalate	3100	670
Benzo(a)anthracene	BDL	670
3,3'-Dichlorobenzidine	BDL	670
Chrysene	81 J	670
bis(2-Ethylhexyl)phthalate	2000	670
Di-n-octylphthalate	110 J	670
Benzo(b)fluoranthene	100 J (2)	670
Benzo(k)fluoranthene	100 J (2)	670
Benzo(a)pyrene	BDL	670
Indeno(1,2,3-cd)pyrene	BDL	670
Dibenz(a,h)anthracene	BDL	670
Benzo(g,h,i)perylene	BDL	670

Surrogates	% Recovery	Acceptance Window
2-Fluorophenol	74%	25-121%
Phenol-d5	67%	24-113%
Nitrobenzene-d5	73%	23-120%
2-Fluorobiphenyl	56%	30-115%
2,4,6-Tribromophenol	50%	19-122%
Terphenyl-d14	58%	18-137%

BDL: Below Detection Limit.
DL: Detection Limit.

J - Estimated concentration of analyte which is present but at a concentration less than the stated detection limit.
(1): Cannot be separated from Diphenylamine.
(2): Indistinguishable Isomers.
*: Sample analyzed using a 2:1 dilution with results and detection limit calculations based on dry weight.

Approved by: _____

CHEMWEST ANALYTICAL LABORATORIES
TENTATIVELY IDENTIFIED SEMIVOLATILE COMPOUNDS

Client I.D.: 8924D019 | CHEMWEST I.D.: 4053-5
Date Analyzed: 06/22/89 | Matrix: Precipitate

Compound	Estimated Conc. (ug/Kg)
2-Octen-2-OL, Acetate (Unknown)	2600 J
Benzene,1,3,5-Trimethyl- (Unknown)	3800 J
Octanal (Unknown)	4600 J
Heptanoic Acid	14000 J
Nonanoic Acid	44000 J
Phthalic Anhydride	14000 J
Glycine, N-Methyl-N-Oxododecyl)- (Unknown)	11000 J
Hexanoic Acid, 1-Methylhexyl Ester (Unknown)	6900 J
Octanoic Acid, 8-Hydroxy- (Unknown)	3200 J
Tetradecanoic Acid	3000 J
Hexadenoic Acid	20000 J
3-Octadecenal (Unknown)	2600 J
Oxacyclotetradecane-2,11-Dione, 13-Methyl- (Unknown)	8900 J
Octadecanoic Acid (Unknown)	9500 J
Ethanone,1-(1,3-Dimethyl-3-Cyclohexen-1-YL)- (Unknown)	5900 J
Hexadecanoic Acid, 2-Hydroxy-1-(Hydroxymethyl)Ethyl (Unknown)	3400 J
1,2,3-Pro[anetriol,1-(1-Phenyl-1H-Pyrazolo[3,4-B]QU (Unknown)	2600 J
Cyclohexanone	2500 J
1-Butanamine (Unknown)	1700 J
Pentanoicacid	1600 J

J - Indicates an estimated concentration which is determined assuming a 1:1 response.

Approved by: _____ REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D020
Date Extracted: 06/20/89
Date Analyzed : 06/21/89

CHEMWEST I.D.: 4053-6
Matrix: Precipitate
Amount Extracted: 30.0g
Dry Weight Factor: 1.01

Compound	Amount Detected (ug/Kg)	DL * (ug/Kg)
Phenol	BDL	1700
2-Chlorophenol	BDL	1700
bis(2-Chloroethyl) ether	BDL	3400
1,3-Dichlorobenzene	BDL	1700
1,4-Dichlorobenzene	BDL	1700
1,2-Dichlorobenzene	BDL	1700
Benzyl alcohol	BDL	1700
2-Methylphenol	BDL	1700
bis(2-Chloroisopropyl) ether	BDL	1700
Hexachloroethane	BDL	1700
N-Nitroso-di-n-propylamine	BDL	1700
4-Methylphenol	240 J	1700
Nitrobenzene	BDL	1700
Isophorone	BDL	1700
2-Nitrophenol	BDL	1700
2,4-Dimethylphenol	BDL	1700
bis(2-Chloroethoxy) methane	BDL	1700
2,4-Dichlorophenol	BDL	1700
1,2,4-Trichlorobenzene	BDL	1700
Benzoic acid	BDL	17000
Naphthalene	BDL	1700
4-Chloroaniline	BDL	1700
Hexachlorobutadiene	BDL	1700
4-Chloro-3-methylphenol	BDL	1700
2-Methylnaphthalene	BDL	1700
Hexachlorocyclopentadiene	BDL	1700
2,4,6-Trichlorophenol	BDL	3400
2,4,5-Trichlorophenol	BDL	3400
2-Chloronaphthalene	BDL	1700
2-Nitroaniline	BDL	1700
Acenaphthylene	BDL	1700
Dimethylphthalate	BDL	1700
2,6-Dinitrotoluene	BDL	1700
3-Nitroaniline	BDL	2400
Acenaphthene	BDL	1700
2,4-Dinitrophenol	BDL	6700
Dibenzofuran	BDL	1700
4-Nitrophenol	BDL	1700
2,4-Dinitrotoluene	BDL	1700
Fluorene	BDL	1700
4-Chlorophenyl-phenylether	BDL	1700
Diethylphthalate	BDL	1700
4-Nitroaniline	BDL	3400
4,6-Dinitro-2-methylphenol	BDL	5000

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D020

CHEMWEST I.D.: 4053-6
Matrix: Precipitate

Compound	Amount Detected (ug/Kg)	DL * (ug/Kg)
N-Nitrosodiphenylamine (1)	BDL	1700
4-Bromophenyl-phenylether	BDL	1700
Hexachlorobenzene	BDL	1700
Pentachlorophenol	BDL	3400
Phenanthrene	300 J	1700
Anthracene	BDL	1700
Di-n-butylphthalate	660 J	1700
Fluoranthene	520 J	1700
Pyrene	420 J	1700
Butylbenzylphthalate	16000	1700
Benzo(a)anthracene	BDL	1700
3,3'-Dichlorobenzidine	BDL	1700
Chrysene	270 J	1700
bis(2-Ethylhexyl)phthalate	2500	1700
Di-n-octylphthalate	BDL	1700
Benzo(b)fluoranthene	BDL	1700
Benzo(k)fluoranthene	BDL	1700
Benzo(a)pyrene	BDL	1700
Indeno(1,2,3-cd)pyrene	BDL	1700
Dibenz(a,h)anthracene	BDL	1700
Benzo(g,h,i)perylene	BDL	1700

Surrogates	% Recovery	Acceptance Window
2-Fluorophenol	66%	25-121%
Phenol-d5	69%	24-113%
Nitrobenzene-d5	98%	23-120%
2-Fluorobiphenyl	73%	30-115%
2,4,6-Tribromophenol	59%	19-122%
Terphenyl-d14	72%	18-137%

BDL: Below Detection Limit.
DL: Detection Limit.

J - Estimated concentration of analyte which is present but at a concentration less than the stated detection limit.
(1): Cannot be separated from Diphenylamine.
*: Sample analyzed using a 5:1 dilution with results and detection limit calculations based on dry weight.

Approved by: [signature]

REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
TENTATIVELY IDENTIFIED SEMIVOLATILE COMPOUNDS

Client I.D.: 8924D020
Date Analyzed: 06/21/89

CHEMWEST I.D.: 4053-6
Matrix : Precipitate

Compound	Estimated Conc. (ug/Kg)
Hexanoic Acid (DOT)	33000 J
Heptanoic Acid (Unknown)	11000 J
Octanoic Acid	18000 J
Nonanoic Acid (Unknown)	30000 J
Phthalic Anhydride	42000 J
Bicyclo[2.2.2]Octane, 1-Methoxy-4-Methyl- (Unknown)	3900 J
Decanoic Acid (Unknown)	3200 J
Nitrofurantion (Unknown)	5800 J
Hexadecanoic Acid (Unknown)	25000 J
9,10-Anthracenedione (Unknown)	4000 J
Undecanal, 2-Methyl- (Unknown)	3400 J
Dodecane 1,2-Bromo- (Unknown)	8500 J
2H-Pyran-2-One, Tetrahydro-6-Propyl- (Unknown)	5800 J
Octadecanal, 2-Bromo- (Unknown)	4000 J
Hexadecanoic Acid, 2-Hydroxy-1-(Hydroxymethyl) Ethyl (Unknown)	13000 J
1,2,3-Propanetriol, 1-(1-Phenyl-1H-Pyrazolo[3,4-B]QU (Unknown)	5300 J
1-Tridecanol (Unknown)	7300 J
Butanoicacid (Unknown)	3500 J
Petanoicacid (Unknown)	2300 J
Heptanol	770 J

J - Indicates an estimated concentration which is determined assuming a 1:1 response.

Approved by: _____ REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D021
Date Extracted: 06/21/89
Date Analyzed : 06/22/89

CHEMWEST I.D.: 4053-7
Matrix: Precipitate
Amount Extracted: 1.00g
Dry Weight Factor: 1.01

Compound	Amount Detected (ug/Kg)	DL * (ug/Kg)
Phenol	BDL	20000
2-Chlorophenol	BDL	20000
bis(2-Chloroethyl) ether	BDL	40000
1,3-Dichlorobenzene	BDL	20000
1,4-Dichlorobenzene	BDL	20000
1,2-Dichlorobenzene	BDL	20000
Benzyl alcohol	BDL	20000
2-Methylphenol	BDL	20000
bis(2-Chloroisopropyl) ether	BDL	20000
Hexachloroethane	BDL	20000
N-Nitroso-di-n-propylamine	BDL	20000
4-Methylphenol	BDL	20000
Nitrobenzene	BDL	20000
Isophorone	BDL	20000
2-Nitrophenol	BDL	20000
2,4-Dimethylphenol	BDL	20000
bis(2-Chloroethoxy) methane	BDL	20000
2,4-Dichlorophenol	BDL	20000
1,2,4-Trichlorobenzene	BDL	20000
Benzoic acid	BDL	200000
Naphthalene	BDL	20000
4-Chloroaniline	BDL	20000
Hexachlorobutadiene	BDL	20000
4-Chloro-3-methylphenol	BDL	20000
2-Methylnaphthalene	BDL	20000
Hexachlorocyclopentadiene	BDL	20000
2,4,6-Trichlorophenol	BDL	40000
2,4,5-Trichlorophenol	BDL	40000
2-Chloronaphthalene	BDL	20000
2-Nitroaniline	BDL	20000
Acenaphthylene	BDL	20000
Dimethylphthalate	BDL	20000
2,6-Dinitrotoluene	BDL	20000
3-Nitroaniline	BDL	40000
Acenaphthene	BDL	20000
2,4-Dinitrophenol	BDL	80000
Dibenzofuran	BDL	20000
4-Nitrophenol	BDL	20000
2,4-Dinitrotoluene	BDL	20000
Fluorene	BDL	20000
4-Chlorophenyl-phenylether	BDL	20000
Diethylphthalate	BDL	20000
4-Nitroaniline	BDL	40000
4,6-Dinitro-2-methylphenol	BDL	60000

CHEMWEST ANALYTICAL LABORATORIES
SEMIVOLATILE ORGANICS

Client I.D.: 8924D021

CHEMWEST I.D.: 4053-7
Matrix: Precipitate

Compound	Amount Detected (ug/Kg)	DL * (ug/Kg)
N-Nitrosodiphenylamine (1)	BDL	20000
4-Bromophenyl-phenylether	BDL	20000
Hexachlorobenzene	BDL	20000
Pentachlorophenol	BDL	40000
Phenanthrene	BDL	20000
Anthracene	BDL	20000
Di-n-butylphthalate	2200 J	20000
Fluoranthene	BDL	20000
Pyrene	BDL	20000
Butylbenzylphthalate	2200 J	20000
Benzo(a)anthracene	BDL	20000
3,3'-Dichlorobenzidine	BDL	20000
Chrysene	BDL	20000
bis(2-Ethylhexyl)phthalate	9300 J	20000
Di-n-octylphthalate	BDL	20000
Benzo(b)fluoranthene	BDL	20000
Benzo(k)fluoranthene	BDL	20000
Benzo(a)pyrene	BDL	20000
Indeno(1,2,3-cd)pyrene	BDL	20000
Dibenz(a,h)anthracene	BDL	20000
Benzo(g,h,i)perylene	BDL	20000

Surrogates	% Recovery	Acceptance Window
2-Fluorophenol	105%	25-121%
Phenol-d5	102%	24-113%
Nitrobenzene-d5	103%	23-120%
2-Fluorobiphenyl	87%	30-115%
2,4,6-Tribromophenol	86%	19-122%
Terphenyl-d14	92%	18-137%

BDL: Below Detection Limit.
DL: Detection Limit.

J - Estimated concentration of analyte which is present but at a concentration less than the stated detection limit.
(1): Cannot be separated from Diphenylamine.
*: Extracted as a medium level with results and detection limit calculations based on dry weight.

Approved by: _____

REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
TENTATIVELY IDENTIFIED SEMIVOLATILE COMPOUNDS

Client I.D.: 8924D021 CHEMWEST I.D.: 4053-7
Date Analyzed: 06/22/89 Matrix : Precipitate

Compound	Estimated Conc. (ug/Kg)
Hexanoic Acid (DOT) (Unknown)	34000 J
Dodecanal	11000 J
Octanoic Acid (Unknown)	16000 J
Nonanoic Acid (Unknown)	19000 J
Phthalic Anhydride	190000 J
Tetradecanoic Acid (Unknown)	22000 J
Hexadecanoic Acid (Unknown)	240000 J
2-Propenoic Acid,2-(Dimethylamino)Ethyl Ester (Unknown)	12000 J
7-Hexadecene,(Z)- (Unknown)	22000 J
Hexadecanoic Acid (Unknown)	150000 J
2H-Pyran-2-One,Tetrahydro-2-Tridecyl- (Unknown)	1600 J
Hexadecanoic Acid,2-Hydroxy-1-(Hydroxymethyl)Ethyl	1400 J
Phosphoric Acid,Tris(3-Methylphenyl)Ester (Unknown)	110000 J
2-Propenenitrile,3-Phenyl-,(E)- (Unknown)	150000 J
Propanoic Acid,2,2Propanoic Acid,2,2-Dimethyl-, 2-(1,1-Dimethylethyl)- (Unknown)	12000 J
3,7,11-Tridecatrienoic Acid,4,8,12-Trimethyl-,Methyl (Unknown)	16000 J
Eicosane,9-Cyclohexyl- (Unknown)	19000 J
Cyclotetrasiloxane,Octamehtyl- (Unknown)	110000 J
Benzene,1,1'-(Fluorocyclopropylidine)Bis- (Unknown)	110000 J
Cyclohexanone	40000 J

J - Indicates an estimated concentration which is determined assuming a 1:1 response.

Approved by: REV3:9.88

CHEMWEST ANALYTICAL LABORATORIES
TOTAL PETROLEUM HYDROCARBONS - EXTRACTABLE

Date Extracted: 06/19/89
Date Analyzed : 06/20/89

Case : 4053
Matrix: Water

Client ID	CHEMWEST ID	Gasoline Amount Detected (ug/L)	Gasoline RL (ug/L)	Diesel Amount Detected (ug/L)	Diesel RL (ug/L)	Other Hydrocarbon Mixture (1) Amount Detected (ug/L)	Other Hydrocarbon Mixture (1) RL (ug/L)
8924D015	4053-1	BRL	100	BRL	100	BRL	100
8924D016	4053-2	BRL	100	BRL	100	410 *	100
8924D017	4053-3	BRL	100	BRL	100	160 *	100
8924D018	4053-4	BRL	100	BRL	100	BRL	100

BRL: Below Reporting Limit.
RL: Reporting Limit.

(1): Other hydrocarbon mixtures are quantitated and reported as diesel.
*: An unknown hydrocarbon mixture beyond the range of gasoline is present in this sample. The fingerprint present is not characteristic of diesel fuel, and may represent an intermediate altered or weathered grade of fuel heavier than gas and lighter than diesel fuel.

Approved by: [signature]

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
pH

Date Analyzed: 06/22/89

Case : 4053
Matrix: Water

Client ID	CHEMWEST ID	Result
8924D015	4053-1	2.1
8924D016	4053-2	0.9
8924D017	4053-3	1.5
8924D018	4053-4	5.3

Approved by: _____

REV2:1.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: Method Blank
Date(s) Analyzed: 06/20/89
thru: 06/21/89

CHEMWEST I.D.: 4053-MB
Matrix: Water

Element	Type	Method	Amount Detected (mg/L)	RL (mg/L)
Aluminum	ICAP	EPA 200.7	BRL	0.2
Antimony	ICAP	EPA 200.7	BRL	0.2
Arsenic	ICAP	EPA 200.7	BRL	0.1
Barium	ICAP	EPA 200.7	BRL	0.2
Beryllium	ICAP	EPA 200.7	BRL	0.01
Boron	ICAP	EPA 200.7	BRL	0.1
Cadmium	ICAP	EPA 200.7	BRL	0.01
Calcium	ICAP	EPA 200.7	BRL	2.5
Chromium (Total)	ICAP	EPA 200.7	BRL	0.01
Cobalt	ICAP	EPA 200.7	BRL	0.05
Copper	ICAP	EPA 200.7	BRL	0.05
Iron	ICAP	EPA 200.7	BRL	0.2
Lead	ICAP	EPA 200.7	BRL	0.2
Magnesium	ICAP	EPA 200.7	BRL	2.5
Manganese	ICAP	EPA 200.7	BRL	0.02
Molybdenum	ICAP	EPA 200.7	BRL	0.5
Nickel	ICAP	EPA 200.7	BRL	0.05
Potassium	ICAP	EPA 200.7	BRL	5.0
Selenium	ICAP	EPA 200.7	BRL	0.2
Silver	ICAP	EPA 200.7	BRL	0.05
Sodium	ICAP	EPA 200.7	BRL	2.5
Thallium	ICAP	EPA 200.7	BRL	0.4
Vanadium	ICAP	EPA 200.7	BRL	0.05
Zinc	ICAP	EPA 200.7	BRL	0.02

BRL: Below Reporting Limit.
RL: Reporting Limit.
ICAP: Inductively Coupled Argon Plasma.

Approved by: [signature]

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: Method Blank
Date(s) Analyzed: 06/21/89

CHEMWEST I.D.: 4053-MB
Matrix: Precipitate

Element	Type	Method	Amount Detected (mg/Kg)	RL (mg/Kg)
Aluminum	ICAP	EPA 6010	BRL	40
Antimony	ICAP	EPA 6010	BRL	20
Arsenic	ICAP	EPA 6010	BRL	10
Barium	ICAP	EPA 6010	BRL	40
Beryllium	ICAP	EPA 6010	BRL	1
Boron	ICAP	EPA 6010	BRL	20
Cadmium	ICAP	EPA 6010	BRL	1
Calcium	ICAP	EPA 6010	BRL	50
Chromium (Total)	ICAP	EPA 6010	BRL	2
Cobalt	ICAP	EPA 6010	BRL	10
Copper	ICAP	EPA 6010	BRL	5
Iron	ICAP	EPA 6010	BRL	20
Lead	ICAP	EPA 6010	BRL	10
Magnesium	ICAP	EPA 6010	BRL	50
Manganese	ICAP	EPA 6010	BRL	5
Molybdenum	ICAP	EPA 6010	BRL	10
Nickel	ICAP	EPA 6010	BRL	10
Potassium	ICAP	EPA 6010	BRL	50
Selenium	ICAP	EPA 6010	BRL	20
Silver	ICAP	EPA 6010	BRL	5
Sodium	ICAP	EPA 6010	BRL	50
Thallium	ICAP	EPA 6010	BRL	40
Vanadium	ICAP	EPA 6010	BRL	10
Zinc	ICAP	EPA 6010	BRL	5

BRL: Below Reporting Limit.
RL: Reporting Limit.
ICAP: Inductively Coupled Argon Plasma.

Approved by: _____

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: 8924D015
Date(s) Analyzed: 06/20/89
thru: 06/21/89

CHEMWEST I.D.: 4053-1
Matrix: Water

Element	Type	Method	Amount Detected (mg/L)	RL (mg/L)	
Aluminum	ICAP	EPA 200.7	110	0.2	
Antimony	ICAP	EPA 200.7	BRL	0.2	
Arsenic	ICAP	EPA 200.7	BRL	0.1	
Barium	ICAP	EPA 200.7	BRL	0.2	
Beryllium	ICAP	EPA 200.7	BRL	0.01	
Boron	ICAP	EPA 200.7	0.2	0.1	
Cadmium	ICAP	EPA 200.7	BRL	0.01	
Calcium	ICAP	EPA 200.7	120	2.5	
Chromium (Total)	ICAP	EPA 200.7	230	0.01	
Cobalt	ICAP	EPA 200.7	BRL	0.05	
Copper	ICAP	EPA 200.7	3.1	0.05	
Iron	ICAP	EPA 200.7	120	0.2	
Lead	ICAP	EPA 200.7	0.5	0.2	
Magnesium	ICAP	EPA 200.7	20	2.5	
Manganese	ICAP	EPA 200.7	4.1	0.02	
Molybdenum	ICAP	EPA 200.7	BRL	0.5	
Nickel	ICAP	EPA 200.7	1.2	0.05	
Potassium	ICAP	EPA 200.7	14	5.0	
Selenium	ICAP	EPA 200.7	220	0.2	
Silver	ICAP	EPA 200.7	BRL	0.05	
Sodium	ICAP	EPA 200.7	BRL	2.5	
Thallium	ICAP	EPA 200.7	BRL	0.4	
Vanadium	ICAP	EPA 200.7	BRL	0.25	INT
Zinc	ICAP	EPA 200.7	4.2	0.02	

BRL: Below Reporting Limit.
RL: Reporting Limit.
ICAP: Inductively Coupled Argon Plasma.
INT: Interferences necessitated a raise in the reporting limit.

Approved by: [signature]

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: 8924D016
Date(s) Analyzed: 06/20/89
thru: 06/21/89

CHEMWEST I.D.: 4053-2
Matrix: Water

Element	Type	Method	Amount Detected (mg/L)	RL (mg/L)	
Aluminum	ICAP	EPA 200.7	90	0.2	
Antimony	ICAP	EPA 200.7	BRL	0.2	
Arsenic	ICAP	EPA 200.7	BRL	0.5	INT
Barium	ICAP	EPA 200.7	BRL	0.2	
Beryllium	ICAP	EPA 200.7	BRL	0.01	
Boron	ICAP	EPA 200.7	2.1	0.1	
Cadmium	ICAP	EPA 200.7	BRL	0.01	
Calcium	ICAP	EPA 200.7	27	2.5	
Chromium (Total)	ICAP	EPA 200.7	6.8	0.01	
Cobalt	ICAP	EPA 200.7	BRL	0.05	
Copper	ICAP	EPA 200.7	0.88	0.05	
Iron	ICAP	EPA 200.7	2800	0.2	
Lead	ICAP	EPA 200.7	3.6	0.2	
Magnesium	ICAP	EPA 200.7	24	2.5	
Manganese	ICAP	EPA 200.7	12	0.02	
Molybdenum	ICAP	EPA 200.7	BRL	1.0	INT
Nickel	ICAP	EPA 200.7	1.8	0.05	
Potassium	ICAP	EPA 200.7	18	5.0	
Selenium	ICAP	EPA 200.7	2.5	0.2	
Silver	ICAP	EPA 200.7	BRL	0.05	
Sodium	ICAP	EPA 200.7	21	2.5	
Thallium	ICAP	EPA 200.7	BRL	1.5	INT
Vanadium	ICAP	EPA 200.7	0.56	0.05	
Zinc	ICAP	EPA 200.7	3.4	0.02	

BRL: Below Reporting Limit.
RL: Reporting Limit.
INT: Interference necessitated a raise in reporting limit.
ICAP: Inductively Coupled Argon Plasma.

Approved by: [signature]

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: 8924D017
Date(s) Analyzed: 06/20/89
thru: 06/21/89

CHEMWEST I.D.: 4053-3
Matrix: Water

Element	Type	Method	Amount Detected (mg/L)	RL (mg/L)	
Aluminum	ICAP	EPA 200.7	300	0.2	
Antimony	ICAP	EPA 200.7	BRL	0.2	
Arsenic	ICAP	EPA 200.7	BRL	0.5	INT
Barium	ICAP	EPA 200.7	BRL	0.2	
Beryllium	ICAP	EPA 200.7	BRL	0.01	
Boron	ICAP	EPA 200.7	2.0	0.1	
Cadmium	ICAP	EPA 200.7	BRL	0.01	
Calcium	ICAP	EPA 200.7	73	2.5	
Chromium (Total)	ICAP	EPA 200.7	320	0.01	
Cobalt	ICAP	EPA 200.7	0.19	0.05	
Copper	ICAP	EPA 200.7	32	0.05	
Iron	ICAP	EPA 200.7	2500	0.2	
Lead	ICAP	EPA 200.7	4.1	0.2	
Magnesium	ICAP	EPA 200.7	90	2.5	
Manganese	ICAP	EPA 200.7	29	0.02	
Molybdenum	ICAP	EPA 200.7	BRL	1.0	INT
Nickel	ICAP	EPA 200.7	2.3	0.05	
Potassium	ICAP	EPA 200.7	34	5.0	
Selenium	ICAP	EPA 200.7	2.2	0.2	
Silver	ICAP	EPA 200.7	BRL	0.05	
Sodium	ICAP	EPA 200.7	64	2.5	
Thallium	ICAP	EPA 200.7	BRL	1.5	INT
Vanadium	ICAP	EPA 200.7	0.55	0.05	
Zinc	ICAP	EPA 200.7	23	0.02	

BRL: Below Reporting Limit.
RL: Reporting Limit.
INT: Interference necessitated a raise in reporting limit.
ICAP: Inductively Coupled Argon Plasma.

Approved by: _____

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: 8924D018
Date(s) Analyzed: 06/20/89
thru: 06/21/89

CHEMWEST I.D.: 4053-4
Matrix: Water

Element	Type	Method	Amount Detected (mg/L)	RL (mg/L)
Aluminum	ICAP	EPA 200.7	1.0	0.2
Antimony	ICAP	EPA 200.7	BRL	0.2
Arsenic	ICAP	EPA 200.7	BRL	0.1
Barium	ICAP	EPA 200.7	BRL	0.2
Beryllium	ICAP	EPA 200.7	BRL	0.01
Boron	ICAP	EPA 200.7	0.1	0.1
Cadmium	ICAP	EPA 200.7	BRL	0.01
Calcium	ICAP	EPA 200.7	190	2.5
Chromium (Total)	ICAP	EPA 200.7	0.44	0.01
Cobalt	ICAP	EPA 200.7	BRL	0.05
Copper	ICAP	EPA 200.7	0.21	0.05
Iron	ICAP	EPA 200.7	65	0.2
Lead	ICAP	EPA 200.7	0.3	0.2
Magnesium	ICAP	EPA 200.7	7.5	2.5
Manganese	ICAP	EPA 200.7	0.21	0.02
Molybdenum	ICAP	EPA 200.7	BRL	0.05
Nickel	ICAP	EPA 200.7	BRL	0.05
Potassium	ICAP	EPA 200.7	13	5.0
Selenium	ICAP	EPA 200.7	BRL	0.2
Silver	ICAP	EPA 200.7	BRL	0.05
Sodium	ICAP	EPA 200.7	63	2.5
Thallium	ICAP	EPA 200.7	BRL	0.4
Vanadium	ICAP	EPA 200.7	BRL	0.05
Zinc	ICAP	EPA 200.7	0.58	0.02

BRL: Below Reporting Limit.
RL: Reporting Limit.
INT: Interference necessitated a raise in reporting limit.
ICAP: Inductively Coupled Argon Plasma.

Approved by: JL

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: 8924D019
Date(s) Analyzed: 06/20/89
thru: 06/21/89

CHEMWEST I.D.: 4053-5
Matrix: Precipitate

Element	Type	Method	Amount Detected (mg/Kg)	RL (mg/Kg)
Aluminum	ICAP	EPA 6010	2500	40
Antimony	ICAP	EPA 6010	BRL	20
Arsenic	ICAP	EPA 6010	65	10
Barium	ICAP	EPA 6010	20000	40
Beryllium	ICAP	EPA 6010	BRL	1
Boron	ICAP	EPA 6010	BRL	20
Cadmium	ICAP	EPA 6010	24	1
Calcium	ICAP	EPA 6010	3200	50
Chromium (Total)	ICAP	EPA 6010	50000	2
Cobalt	ICAP	EPA 6010	57	10
Copper	ICAP	EPA 6010	21000	5
Iron	ICAP	EPA 6010	10000	20
Lead	ICAP	EPA 6010	4600	10
Magnesium	ICAP	EPA 6010	11000	50
Manganese	ICAP	EPA 6010	280	5
Molybdenum	ICAP	EPA 6010	BRL	10
Nickel	ICAP	EPA 6010	71	10
Potassium	ICAP	EPA 6010	17000	50
Selenium	ICAP	EPA 6010	BRL	20
Silver	ICAP	EPA 6010	BRL	5
Sodium	ICAP	EPA 6010	600	50
Thallium	ICAP	EPA 6010	BRL	40
Vanadium	ICAP	EPA 6010	BRL	10
Zinc	ICAP	EPA 6010	120000	5

BRL: Below Reporting Limit.
RL: Reporting Limit.
ICAP: Inductively Coupled Argon Plasma.

Approved by: _____

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: 8924D020
Date(s) Analyzed: 06/20/89
thru: 06/21/89

CHEMWEST I.D.: 4053-6
Matrix: Precipitate

Element	Type	Method	Amount Detected (mg/Kg)	RL (mg/Kg)
Aluminum	ICAP	EPA 6010	2500	40
Antimony	ICAP	EPA 6010	BRL	20
Arsenic	ICAP	EPA 6010	BRL	10
Barium	ICAP	EPA 6010	390	40
Beryllium	ICAP	EPA 6010	BRL	1
Boron	ICAP	EPA 6010	BRL	20
Cadmium	ICAP	EPA 6010	50	1
Calcium	ICAP	EPA 6010	4900	50
Chromium (Total)	ICAP	EPA 6010	53000	2
Cobalt	ICAP	EPA 6010	100	10
Copper	ICAP	EPA 6010	2100	5
Iron	ICAP	EPA 6010	5600	20
Lead	ICAP	EPA 6010	4600	10
Magnesium	ICAP	EPA 6010	7100	50
Manganese	ICAP	EPA 6010	180	5
Molybdenum	ICAP	EPA 6010	BRL	10
Nickel	ICAP	EPA 6010	52	10
Potassium	ICAP	EPA 6010	19000	50
Selenium	ICAP	EPA 6010	BRL	20
Silver	ICAP	EPA 6010	BRL	5
Sodium	ICAP	EPA 6010	1100	50
Thallium	ICAP	EPA 6010	BRL	40
Vanadium	ICAP	EPA 6010	BRL	10
Zinc	ICAP	EPA 6010	130000	5

BRL: Below Reporting Limit.
RL: Reporting Limit.
ICAP: Inductively Coupled Argon Plasma.

Approved by: _____

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: 8924D021
Date(s) Analyzed: 06/20/89
thru: 06/21/89

CHEMWEST I.D.: 4053-7
Matrix: Precipitate

Element	Type	Method	Amount Detected (mg/Kg)	RL (mg/Kg)
Aluminum	ICAP	EPA 6010	5200	40
Antimony	ICAP	EPA 6010	BRL	20
Arsenic	ICAP	EPA 6010	BRL	10
Barium	ICAP	EPA 6010	1400	40
Beryllium	ICAP	EPA 6010	BRL	1
Boron	ICAP	EPA 6010	BRL	20
Cadmium	ICAP	EPA 6010	29	1
Calcium	ICAP	EPA 6010	3700	50
Chromium (Total)	ICAP	EPA 6010	38000	2
Cobalt	ICAP	EPA 6010	96	10
Copper	ICAP	EPA 6010	460	5
Iron	ICAP	EPA 6010	20000	20
Lead	ICAP	EPA 6010	3500	10
Magnesium	ICAP	EPA 6010	58	50
Manganese	ICAP	EPA 6010	250	5
Molybdenum	ICAP	EPA 6010	BRL	10
Nickel	ICAP	EPA 6010	290	10
Potassium	ICAP	EPA 6010	13000	50
Selenium	ICAP	EPA 6010	BRL	20
Silver	ICAP	EPA 6010	BRL	5
Sodium	ICAP	EPA 6010	760	50
Thallium	ICAP	EPA 6010	BRL	40
Vanadium	ICAP	EPA 6010	BRL	10
Zinc	ICAP	EPA 6010	93000	5

BRL: Below Reporting Limit.
RL: Reporting Limit.
ICAP: Inductively Coupled Argon Plasma.

Approved by: _____

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: 8924D022
Date(s) Analyzed: 06/20/89
thru: 06/21/89

CHEMWEST I.D.: 4053-8
Matrix: Wipe

Element	Type	Method	Amount Detected (mg/L)	RL (mg/L)
Aluminum	ICAP	EPA 200.7	14	0.2
Antimony	ICAP	EPA 200.7	0.5	0.2
Arsenic	ICAP	EPA 200.7	BRL	0.1
Barium	ICAP	EPA 200.7	2.0	0.2
Beryllium	ICAP	EPA 200.7	BRL	0.01
Boron	ICAP	EPA 200.7	BRL	0.1
Cadmium	ICAP	EPA 200.7	0.03	0.01
Calcium	ICAP	EPA 200.7	120	2.5
Chromium (Total)	ICAP	EPA 200.7	11	0.01
Cobalt	ICAP	EPA 200.7	0.12	0.05
Copper	ICAP	EPA 200.7	2.0	0.05
Iron	ICAP	EPA 200.7	34	0.2
Lead	ICAP	EPA 200.7	53	0.2
Magnesium	ICAP	EPA 200.7	9.5	2.5
Manganese	ICAP	EPA 200.7	1.4	0.02
Molybdenum	ICAP	EPA 200.7	BRL	0.5
Nickel	ICAP	EPA 200.7	0.28	0.05
Potassium	ICAP	EPA 200.7	4.2	5.0
Selenium	ICAP	EPA 200.7	BRL	0.2
Silver	ICAP	EPA 200.7	BRL	0.05
Sodium	ICAP	EPA 200.7	7.0	2.5
Thallium	ICAP	EPA 200.7	BRL	0.4
Vanadium	ICAP	EPA 200.7	0.09	0.05
Zinc	ICAP	EPA 200.7	31	0.02

BRL: Below Reporting Limit.
RL: Reporting Limit.
ICAP: Inductively Coupled Argon Plasma.

Approved by: _____

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: LQCS
Date(s) Analyzed: 06/21/89

CHEMWEST I.D.: 4053-QC
Matrix: Water

Element	Spike Conc. (mg/L)		LQCS-1	LQCS-2	RPD
Aluminum	1.0		97%	103%	6%
Antimony	1.0		105%	105%	0%
Arsenic	1.0		98%	97%	1%
Barium	1.0		102%	102%	0%
Beryllium	1.0		100%	100%	0%
Boron	1.0		102%	102%	0%
Cadmium	1.0		88%	89%	1%
Calcium	1.0		104%	105%	1%
Chromium	1.0		97%	95%	2%
Cobalt	1.0		98%	99%	1%
Copper	1.0		104%	103%	1%
Iron	1.0		102%	101%	1%
Lead	1.0		100%	102%	2%
Magnesium	1.0		104%	104%	0%
Manganese	1.0		97%	98%	1%
Molybdenum	1.0		106%	108%	2%
Nickel	1.0		101%	102%	1%
Potassium	10.0		108%	106%	2%
Selenium	1.0		100%	98%	2%
Silver	1.0		97%	98%	1%
Sodium	1.0	*	124%	121%	2%
Thallium	1.0		101%	99%	2%
Vanadium	1.0		98%	98%	0%
Zinc	1.0		100%	101%	1%

*: Spiked at level below reporting limit.

Approved by: [signature]

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
METALS ANALYSIS

Client I.D.: LQCS
Date(s) Analyzed: 06/21/89

CHEMWEST I.D.: 4053-QC
Matrix: Soil

Element	Spike Conc. (mg/Kg)	LQCS-1	LQCS-2	RPD
Antimony	50	100%	97%	3%
Arsenic	200	94%	90%	4%
Barium	200	98%	94%	4%
Beryllium	5	104%	100%	4%
Cadmium	5	92%	78%	16%
Chromium	20	74%	75%	1%
Cobalt	50	98%	94%	4%
Copper	25	110%	109%	1%
Lead	50	96%	93%	3%
Manganese	50	94%	90%	4%
Molybdenum	NA	*	*	NA
Nickel	50	100%	95%	5%
Selenium	200	92%	91%	1%
Silver	5	87%	86%	1%
Thallium	200	97%	92%	5%
Vanadium	50	95%	91%	4%
Zinc	50	121%	117%	3%

NA: Not Applicable.
*: Not contained in spike solution.

Approved by: [signature]

REV2:9.88

CHEMWEST ANALYTICAL LABORATORIES
HEXAVALENT CHROMIUM

Date(s) Analyzed: 06/20/89 Case: 4053
thru: 06/22/89

Matrix: Water

Client ID	CHEMWEST ID	Method	Amount Detected (mg/L)	RL (mg/L)
Method Blank	4053-MB	EPA 7196	BRL	0.5
8924D015	4053-1	EPA 7196	INT *	0.5
8924D016	4053-2	EPA 7196	INT *	0.5
8924D017	4053-3	EPA 7196	INT *	0.5
8924D018	4053-4	EPA 7196	BRL	0.5

BRL: Below Reporting Limit.
RL: Reporting Limit.
INT *: Unable to analyze due to interfering color of sample which could not be filtered out.

Matrix: Precipitate

Client ID	CHEMWEST ID	Method	Amount Detected (mg/Kg)	RL (mg/Kg)
8924D019	4053-5	EPA 7196	190	25
8924D020	4053-6	EPA 7196	430	50
8924D021	4053-7	EPA 7196	91	25

RL: Reporting Limit.

Matrix: Wipe

Client ID	CHEMWEST ID	Method	Amount Detected (mg/L)	RL (mg/L)
8924D022	4053-8	EPA 7196	BRL	0.5

BRL: Below Reporting Limit.
RL: Reporting Limit.

Approved by: _____ REV2:1.89

600 West North Market Blvd.
Sacramento, California 95834
(916) 923-0840 FAX (916) 923-1938

CLIENT

Date Rec'd 6/16/89 17:45
Compl. Date
Section Kirk Pucan

CLIENT: Harding Lawson Associates
200 Kirk Landing Road
Novato, CA 94949

Project Name: Hunters Point
Project No. 2176.245.02
P.O. NO.
Contact Lisa Teague
Phone (415) 892-6251 (832)

ANALYSIS: Eight samples (waters, precipitate & wipe) received under Chain of custody in CHEMWEST 1 pt. & 1 qt. opaque plastic bottles (4ea.) 1 qt. Amber glass bottles (3) and 80z. clear glass wide mouth jars (4) to be analyzed for Semi-Volatile Organics (EPA Method 625 & 8270), Metals) include Cr+6 (TCP), TPH EXTN./GC-FID and pH. See Memo & Chain of custody.

RUSH

	SAMPLE I.D.	DATE	TIME	ANALYSIS	MATRIX	CONTAINER
4053-1	8924D015	6/16/89	09:30	625, pH, TPH	WATER	4-containers
-2	8924D016	"	10:00	Same as Above	"	4- "
-3	8924D017	"	10:45	" " "	"	4- "
-4	8924D018	"	11:15	" " "	"	5- "
-5	8924D019	"	11:30	8270, Extr. Metals	Precipitate	1-80z jar
-6	8924D020	"	11:45	Same as Above	"	1- "OV "
-7	8924D021	"	12:00	" " "	"	1- " "
-8	8924D022	"	12:15	Metals, Cr+6	Wipe	1- " "

R-2 C-1
BMS
Bill McGeagh

CHEM WEST COURIER

SAMPLE WILL BE HELD 30 DAYS UNLESS LONGER TIME IS ARRANGED

DISTRIBUTION

SAMPLING AT THE PICKLING AND PLATE YARD
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA
December 11, 1989

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QUALITY CONTROL REVIEWER

Chris R. Smith - RG 4619

Appendix C

RESULTS OF DISPOSAL SURVEY

Table C-1. Disposal Site Survey Contacts

Company Name	Service	Location	EPA I.D. No.	Contact	Telephone No.
Casmalia Resources	Landfilling	Santa Barbara, California	CAD020748125	Rick Fisher	805-969-5897
Chemical Waste Management	Landfilling	Kettleman Hills, California	CAT000646117	Mary Scribner (Corporate Contact)	415-651-2964
Chemical Waste Management	Incineration	Chicago, Illinois	ILD098642424	Mary Scribner (Corporate Contact)	415-651-2964
Envirosafe Services	Landfilling	Grandview, Idaho	IDD073114654	Larry Brennan	707-447-4818
Rollins Environmental Services	Incineration	Deer Park, Texas	TXD0055141378	Effie Zissimatos	408-437-9770
U.S. Pollution Control, Inc.	Landfilling	Murray, Utah	UTD991301748	Madeline Russo	916-921-2202
U.S. Pollution Control, Inc.	Chemical PCB Treatment	Murray, Utah	UTD991301748	Bill Stevenson	415-734-0890

Table C-2. Land Disposal - Unit Costs (1)

Waste Category[1]	Units	Envirosafe (Idaho)	USPCI (Utah)	Chem Waste Management (California - Kettleman)	Chem Waste Management (Lake Charles, LA)
Pickling Waste[2]					
Acid/metals liquid	$/gal	1.20-1.50[6]	0.66	1.85	5.45[4]
Soil	$/ton	95.00	140.00	130.00	5.45
Zn/Cr Solids	$/ton	95.00	140.00	130.00	not obtained
Tank S-505					
Oily sludge <50ppm PCB[3]	$/ton	95.00	140.00	130.00	not obtained
Soil <50ppm PCB	$/ton	95.00	140.00	130.00	not obtained
Rinsate <50ppm PCB	$/gal	1.50	0.66	not obtained	not obtained
Steel - PCBs <50ppm	$/cy	not obtained	140	126	not obtained
Tank Farm					
Oil (<50 ppm PCB)	$/gal	1.50	--	not obtained	not obtained
Soil (metals)	$/ton	95.00	140.00	130.00	not obtained

Notes:

1 Costs are based on generic waste category; final costs will be based on hazardous waste characterization required for disposal.

2 Costs do not include treatment, which may be required if land disposal is banned.

3 PCB = Polychlorinated biphenyl.

4 Based on price of $300/55-gallon drum.

5 Will accept only waste above pH = 2.0.

6 Will accept only waste above pH = 3.0.

Table C-3. Transportation Unit Costs (1,2)

Waste Category	Units	Envirosafe (Idaho)	USPCI (Utah)	Chem Waste Management (California - Kettleman)	Rollins (Texas)	Chem Waste Management (Illinois)
Liquids	$/gal	0.46	0.43	0.14	1.40	1.61
Solids	$/ton	96.00	90.00	30.00	NA	NA

Notes

1) Solid waste prices based on 24 tons/trip; cost is higher per ton if there is not a full load.

2) Liquid waste prices based on 5000 gal/trip; cost is higher per gal. if there is not a full load.

Appendix D

RESULTS OF CONTRACTOR SURVEY

Appendix D

RESULTS OF CONTRACTOR SURVEY

Company Name	State Contractor's Number	Hazardous Waste Transporter's Permit Number	Bonding Capacity	Sales and Technical Contract	Telephone Number
Decon Environmental Services, Inc.	545726	CAD982468183	$1 Million	Bruce Jacobsen	(415) 732-6444
Erickson	168067ab	EPA009466392 CALIFORNIA0019	$0	John Cutshall	(415) 235-1393
T.I.E.S.	455752A	CAD982515207 CALIFORNIA2572	$1 Million	Dan Heath	(415) 235-1393
Plant Reclamation	518628	CAD061163556 DOT0569 CHP27585	$25 Million	Fred Glueck	(415) 233-6552

DISTRIBUTION
REMOVAL ACTION WORK PLAN
FOR PICKLING AND PLATE YARD (IR-9)
HUNTERS POINT ANNEX
SAN FRANCISCO, CALIFORNIA
April 26, 1991

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PPL/AV/ld/PL1351-R

QUALITY CONTROL REVIEWER

David F. Leland, P.E.
Associate Engineer

AS PER EXECUTIVE SUMMARY, A SECOND VOLUME CONSISTING OF CONSTRUCTION PLANS AND SPECIFICATIONS WILL BE PREPARED DURING THE DETAILED DESIGN PHASE.

VOLUME II WAS NOT SUBMITTED TO THE ADMINISTRATIVE RECORD

EXTENSIVE RESEARCH WAS PERFORMED BY SOUTHWEST DIVISION TO LOCATE THIS VOLUME. THIS PAGE HAS BEEN INSERTED AS A PLACEHOLDER AND WILL BE REPLACED SHOULD THE MISSING ITEM BE LOCATED.

QUESTIONS MAY BE DIRECTED TO:

DIANE C. SILVA
RECORDS MANAGEMENT SPECIALIST
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132

TELEPHONE: (619) 532-3676